



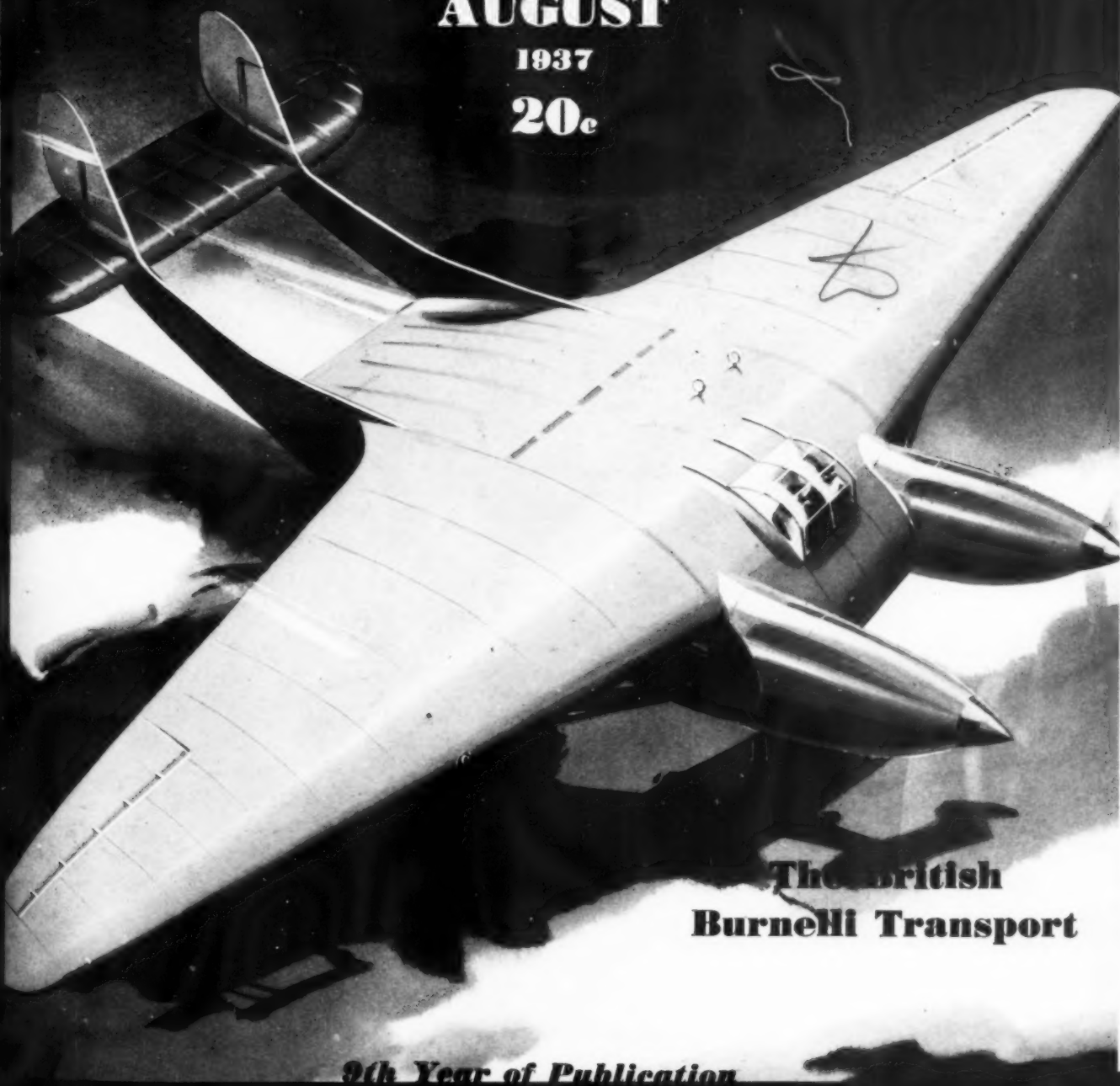
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# MODEL AIRPLANE NEWS

**AUGUST**

**1937**

**20c**



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Burnelli Transport**

*9th Year of Publication*

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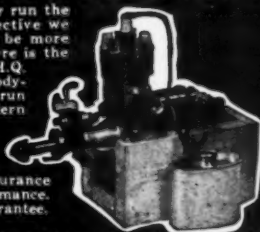
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## G. H. Q. SCORES AGAIN!

April issue of Modern Mechanix contained the following editorial:

Gasoline powered airplane models are finding great favor with aviation fans and a \$3 prize was awarded to Francis Kosanda, of Hopkins, Minn., for his interesting letter:



Francis Kosanda, of Hopkins, Minn., holds gasoline powered model he and Robert Apper constructed. On its initial flight, the 9-foot model flew out of sight but was recovered again.

Dear Editor:

Hopkins, Minn.

Enclosed is a photo of a gas powered model airplane built by Robert Apper, of Minneapolis, and myself. It is of original design and powered with a G. H. Q. motor.

The model weighs five and one-half pounds, has a wing span of nine feet, and an aspect ratio of 8-1. On a test flight the model went out of sight after ten minutes, but was later recovered from a tree overhanging the Mississippi River.

Your articles on gas engines, gas models, and model airplanes are excellent.

Francis Kosanda.

Judging from the report, the gas model must be an excellent cloud chaser and we are glad it was recovered without serious damage.

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# Model AIRPLANE News

9th YEAR OF PUBLICATION

VOL. XVII

No. 2

Edited by Charles Hampson Grant

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### In Our Next Big Issue

#### Our Special 3-View Issue

There will be six full-page 3-view drawings, two of which will be in detail, The Curtiss Hawk "75" and the Grumman F2F-1. Also a drawing of the Douglas 4 engine transport. The ship is now under construction.

**Rocket Flight in America**, by Nick Limber, tells the interesting story of the development of rockets in this country.

**How Much Gas?**, by Carl Goldberg, discusses the advantages of various systems of fuel allowances.

**A Precision Contest Gas Job**, by Elbert Weathers, gives complete plans and instructions to build one of the finest gas models ever to turn a "prop."

**X. G. Wing Sections** include drawings and ordinates for a series of highly efficient wing sections by C. H. Grant for any type of plane you may wish to build.

**An Experimental Flier for Novice or Expert**, by Felix Gutmann, tells you how you can create one of the finest all balsa flying models ever produced.

**A Vought V-143 Fighter That Flies**, by William Winter, provides complete data to build a unique low-wing flying scale model of one of Uncle Sam's latest pursuit ships.

**Stabilizing Your Duration Model**, by C. H. Grant, and other instructive and interesting articles will appear.

Don't Miss This Issue!

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Contributors are especially advised to be sure to retain copies of their contributions, otherwise they are taking unnecessary risk. Every possible effort will be made in our organization to return unavailable manuscripts, photographs and drawings (if accompanied by postage), but we will not be responsible for any loss of such matter contributed.

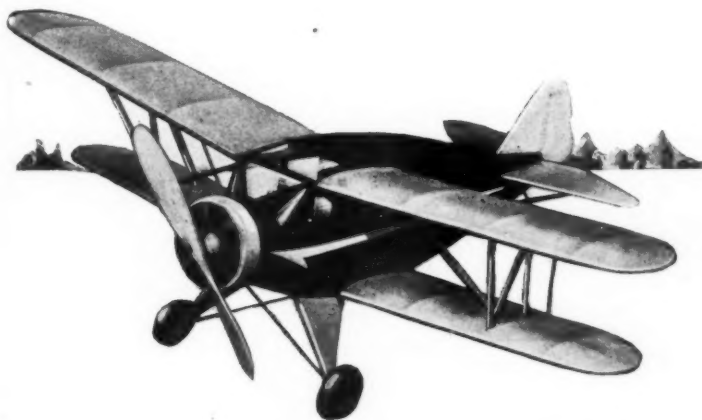


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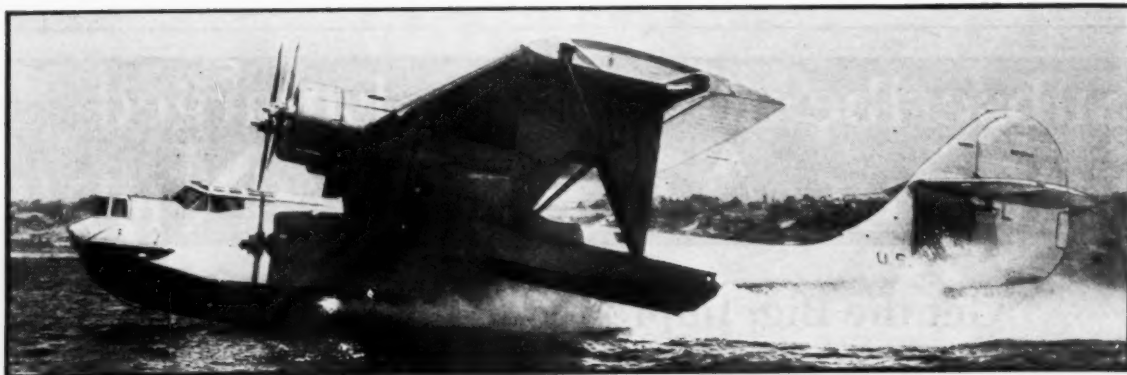
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Name .....

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The Consolidated XP3Y-1 U.S. Navy patrol plane taking off under power of its twin Wasps

# Patrol Planes of the U. S. Navy

A SMALL group of spectators were gathered on the shore near the Hawaiian Naval Air Base eagerly scanning the skies. An excited murmur arose when twelve huge Consolidated patrol-bombers were sighted flying in formation. One by one, the arrivals landed on the unruffled waters of Pearl Harbor on January 28th, 1937, after a grueling non-stop routine flight of 2,553 miles from San Diego, California, completing the longest over-water mass flight in aviation history.

Many years ago, in the winter of 1929, another group of men were standing on the water's edge at the Anacostia Naval Air Station tensely awaiting the moment when the new Consolidated patrol boat, the XPY-1, was to take to the air for its initial naval tests. Many of the men, as they were gathered on the beach, probably were thinking of the time when they flew the old HS-2L and PN flying boats, and were comparing the old boats to this new air giant. They thought of the 400 hp. Liberty that used to thunder away behind their backs as they piloted their HS boats around. These flying boats were used for navigation instruction at Hampton Roads, Virginia, and were really the forerunners of the modern patrol boats. They were biplanes with a wing span of approximately seventy feet and had small floats attached to the undersurface of the lower wings near the wing tips. The HS boats, or the HS-2L flying boats as they were officially designated, had a gunner's pit in the bow of the hull with the pilot sitting behind him.

**How the Naval Patrol Planes Have Been Developed and Have Demonstrated Their Great Value to Our Naval Forces**

By MORTON B. KELMAN

The ship had a vertical rudder and a mono-plane stabilizer that was placed near the top of the fin so that the water would not carry it away when the plane was taking off or landing. At this time there were also

twin-engined flying boats in naval service. These planes appeared shortly after the HS boats did, and had a span of 102 feet, and weighed approximately six tons accommodating a crew of six and were known as the 5F-L type.

Before the 5F flying boat was developed, the NC type that made aviation history when one of these planes, the NC-4, crossed the Atlantic from New York to Southampton via Newfoundland, the Azores, and

Portugal, appeared. This flying boat was the first airplane to cross the Atlantic, taking almost two weeks, from May 16th to May 27th in 1919. This was ten years and eight months after the establishment of naval aviation. It had been early in the fall of 1908 when the Wright Brothers demonstrated one of their planes to naval authorities. Although the plane was not accepted, because it was not a hydroplane, the thought of having a navy in the air remained in the minds of the naval officials. It was not until 1910, when Lieut. T. G. Ellyson flew a seaplane, that interest was again stimulated in naval aviation. In the 1911-1912 Naval Appropriations Act, twenty-five thousand dollars for aviation was included for the first time.

The first Navy-designed seaplane was constructed at the Washington, D.C., Navy Yard by Naval Constructor H. C. Richardson, who later played a huge part in the building of naval patrol boats.

In November, 1915, the first Navy flying boat was catapulted from the deck of the U.S.S. North Carolina. This plane was quite different from those that



The XP3Y-1 in flight over the Consolidated factory at North Island. The wing floats have been pulled up



Three of the P2Y-1 patrol boats before the start of their flight from California to Hawaii



The PBV-1 Navy patrol plane. Note how wing floats may be pulled up to form wing tips

were to follow it. It was several years later when the Navy began to construct their own flying boats to be used for patrol purposes. These patrol boats were known as the PN types and many records were established in them. An endurance record of 28 hours, 35 minutes was made by Lieuts. Schildhauer and Kyle in a PN-9 in May, 1925. On July 9, 1927, Lieut. Byron J. Connell established twelve seaplane records when he remained aloft 11 hours, 7 minutes and 13 seconds, carrying a load of almost 4,500 pounds and covering a distance of 947.58 miles, in a PN-10. Powered with two 525 hp. Cyclones, a PN-12 made a flight of 36 hours, 1 minute, 14 seconds, establishing a new world's record, from May 3rd to May 5th, 1928. The PN boats before the 12 had utilized water-cooled engines, and the installation of the air-cooled engines improved their performance to a great extent. Other PN-12s, powered with air-cooled Hornet engines this time, also established many records.

These patrol boats are large flying boats that are too heavy to operate from the decks and catapults of even the largest naval vessel afloat. They are constructed to be very seaworthy so they can take passage with the fleet using tenders in the battle force as their temporary bases. These flying boats patrol the seas against enemy submarines, surface vessels and aircraft, reporting their discoveries to the fleet by radio. During the World War, American naval aviation participation was confined largely to submarine and coastal patrol work using huge flying boats that had greater endurance than most aircraft of the period. There were seven naval air stations established in the British Isles during the war and quite a bit of damage was done to enemy submarines. As this particular type of aircraft has

been so successful in the past, naval forces the world over have many of these patrol boats in service at the present. The U.S. Navy has also seen the advantages these flying boats possess and have many squadrons of them stationed along the coasts of this country and in Hawaii.

It was in December, 1928, when the new type Consolidated XPY-1 was completed at the company's New York plant. Formerly the Naval Aircraft Factory had constructed all the patrol boats that were to be used in naval service. This was the first private venture into the patrol boat field as the plane was constructed outside of

the Navy factory. The XPY-1 was the first of many more to come that made Consolidated the largest manufacturer of naval patrol boats in the United States.

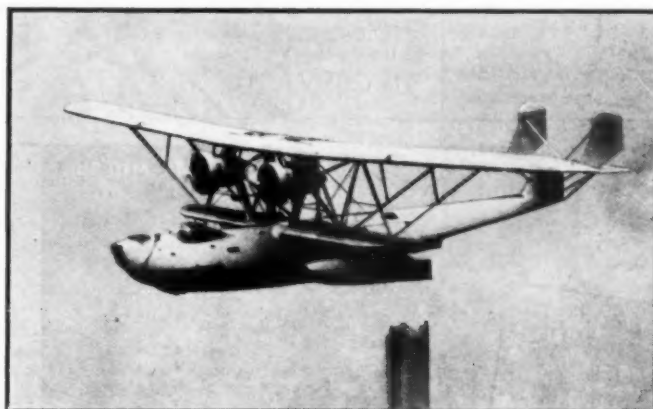
The XPY-1 was disassembled at Buffalo after its completion and sent by rail to the Washington, D.C., Navy Yard arriving on December 26, 1928. The hull was towed to the Anacostia Naval Air Station and was assembled there by January 10, 1929. The official Navy flight tests were conducted soon after it was assembled. The original design of the XPY-1 won a design competition for a naval patrol type flying boat. The plane was powered with two

400-hp. P. & W. Wasp engines and equipped with two-bladed adjustable pitch propellers. The engine nacelles were carried underneath the wing and the center section structure of the wing was designed to take a third engine which would be located on the longitudinal center line above the wing.

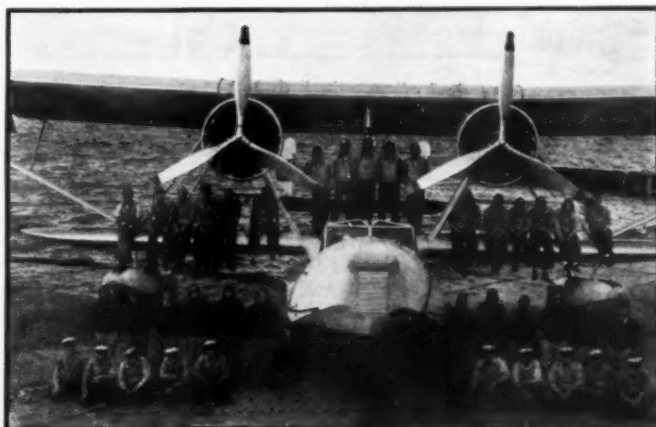
The lines of the hull were laid down by Captain Holden C. Richardson of the Bureau of Aeronautics of the Navy Department. The hull was constructed of 17ST shapes arranged in trusses and floor frames covered with dural plating, and divided into water-tight compartments by bulkheads with water-tight doors and covers.

There were two outboard pontoons located fourteen feet from the center line of the hull that kept the plane balanced when anchored or in action.

The wing and tail surfaces were constructed of 17ST spars, drag trusses and sheet dural ribs fabric-covered and externally braced. The ailerons were of the balanced type and were operated by a wheel control. The tail surfaces were composed of a monoplane stabilizer, a single unbalanced elevator and twin fins with balanced



The Consolidated P2Y-1 Cyclone powered U.S. Navy patrol boat; the forerunner of the XP3Y-1 type

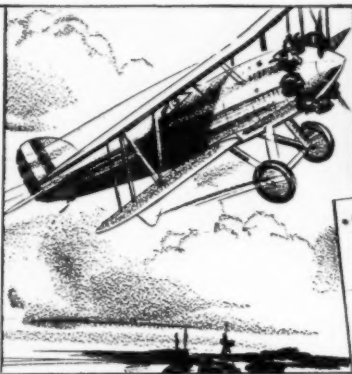


The men and one of the P2Y-1 planes that made the famous Coco Solo non-stop flight



# Heroic Exploits of Aviation

ON JULY 25TH, 1927, LT. C.C. CHAMPION TOOK OFF FROM THE NAVAL AIR STATION, ANACOSTIA, IN HIS WRIGHT APACHE BIPLANE, OUT FOR A NEW WORLD ALTITUDE RECORD, AND PERHAPS THE MOST THRILLING FLIGHT OF HIS CAREER.

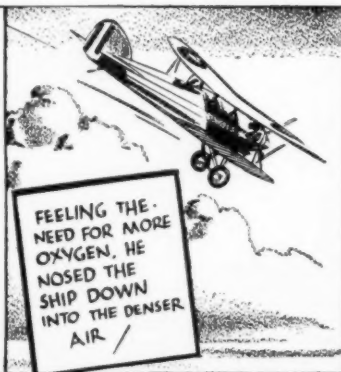


CLIMBING AT THE RATE OF 3000 FEET PER MINUTE, HE WAS IN A SHORT TIME IN THE REGION OF RARIFIED ATMOSPHERE



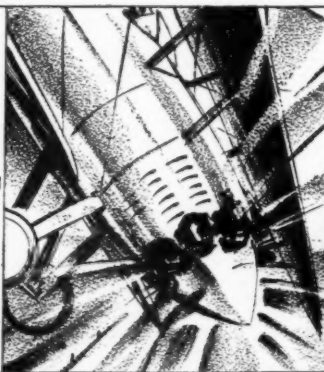
HE PUSHED THE APACHE HIGHER, EVEN ABOVE HER NORMAL CEILING

HE WAS 7 MILES UP!



FEELING THE NEED FOR MORE OXYGEN, HE NOSED THE SHIP DOWN INTO THE DENSER AIR

THE MOTOR WAS RUNNING WIDE OPEN - THE SUDDEN CHANGE AND ACCELERATION WERE TOO MUCH FOR IT - UNABLE TO STAND THE EXCESSIVE STRAIN, IT BLEW TO PIECES!



SEVEN OF THE NINE CYLINDERS WERE BLOWN OUT. HOLES WERE TORN IN THE WINGS, BY THE FLYING BITS, WHICH FORTUNATELY MISSED THE PILOT.

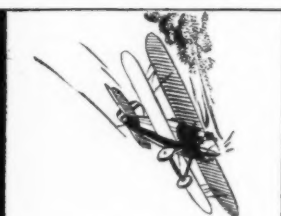
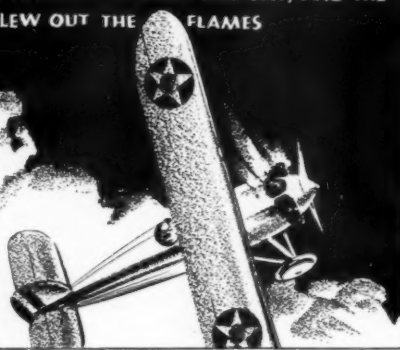
THEN A NEW PERIL!



**FIRE!**

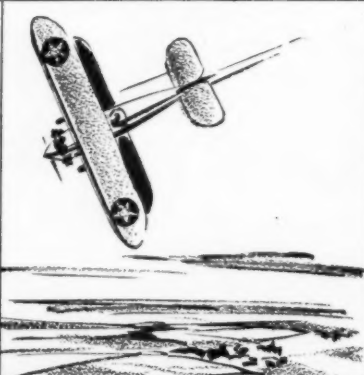
HE PUT THE APACHE IN A STEEP SIDE-SLIP, AND THE WIND BLEW OUT THE FLAMES

DETERMINED TO SAVE THE VALUABLE RECORDING INSTRUMENTS, LT. CHAMPION QUICKLY PUT HIS PLAN INTO ACTION.



HOWEVER, FIRE BROKE OUT SEVERAL TIMES ON THE PRECARIOUS DESCENT, AND EACH TIME SKILLFUL MANEUVERING WAS REQUIRED TO EXTINGUISH THE FLAMES

LT. CHAMPION MADE FOR THE NEAREST CLEARING, A CORN-FIELD ON THE OUTSKIRTS OF THE CITY. HE WAS NOT FAR FROM HIS STARTING POINT AT THE NAVAL AIR STATION, WASHINGTON, D.C.



HE HAD SUCCESSFULLY COMPLETED PERHAPS HIS MOST HAZARDOUS FLIGHT; AND HIS PLANE AND INSTRUMENTS WERE SAFE



A MONTH LATER, HIS MARK OF 38,418 FEET WAS RECOGNIZED BY THE FEDERATION AERONAUTIQUE INTERNATIONALE AS A WORLD RECORD

# We Shall Not Scrap Our Gas Jobs

## Read This and Act Now

**ABOUT** a year and a half ago a conference of expert model designers and builders was held at Newark, N. J. At this conference a member who is not a model expert, condemned gas models.

A number of the members sensed that he was out to prevent the activity of gas model building from gaining popularity and expanding. The gas model champions rose to the challenge.

Since then the International Gas Model Airplane Assn. was organized under the sponsorship of MODEL AIRPLANE NEWS. The whole purpose of this organization was, and is, to promote gas model activities in every form which will be beneficial to model builders and in a manner which will not be detrimental to them, to the art or to anyone with whom they come in contact. It was felt at that time by its director, Mr. Charles Grant, that if all the gas model builders were united under one head it would be, in their hands, an organization impervious to attacks by the inexpert. This organization has grown to a membership of over 3,000 and is composed of about 85 units, located in various parts of the world. In fact, there is a unit in nearly every important country as well as in every one of the United States of America.

Recently the enemies of gas-powered flight have attempted to do what we believed they would eventually do; that is, try to stop the flying and operation of gas models on a nation-wide basis. We therefore call upon you, as one of the leaders and dominating forces in the IGMAA, to collect every bit of "ammunition" possible with which you can combat any action which subversive forces have taken or may take. We cannot impress upon you too strongly that now is the time to act. We make the following suggestions which may help you:

A meeting should be called immediately of all who may be interested in gas model activities in your district. They should be made acquainted with the situation. Inasmuch as attempts are being made to influence the Department of Commerce to ban gas model flying, we suggest that each and every one of the IGMAA members, individually or belonging to a unit, should write Mr. Fred D. Fagg, Jr., Director, Bureau of Air Commerce, United States Department of Commerce, Washington, D. C., and express his views on the matter and assure Mr. Fagg that every possible effort will be made to safeguard the rights of property owners and anyone with whom they may come in contact while operating gas models. Any other comments which they wish to make in defense of gas model flying will be exceedingly helpful.

We also urge that you get in contact with every influential man in your district or state and enlist his aid to put this highly educational feature over and take definite steps against its suppression. Possibly you may know some important men in the political or industrial field; whether they are state senators, congressmen, mayors or

heads of industrial organizations.

In behalf of your own rights and all the members of the organization we beg you to take action.

Another way may be used to combat suppression of the art is to make every one possible acquainted with the value which will result to young men participating in it. This is especially true when one considers the benefits which are derived from this activity. At the present time it has proved to be the greatest force to come forward as far as the education of young men in aeronautics is concerned. Nor is this confined to the science of aeronautics. It is a highly educational thing and those who participate in the art have to do research work in nearly every known science. The fact that this is done under their own initiative and volition is very much more beneficial than any knowledge which may be received from educational courses given by teachers in schools. The science of physics, chemistry, the study of electricity, structural design, the strength of materials and airplane design are all included.

Not only this, but the most important thing of all takes place. They learn how to apply the knowledge received from their research and studies. This is a function which at present our schools do not fulfill completely. The art of craftsmanship is highly emphasized. The young man learns to use his hands as well as his mind and to coordinate these two human factors. A young man cannot build a gas model without understanding something about the operation of a gasoline engine and about the function of the parts which go to make it up; such as the spark, coil, spark plug, condenser and other parts of the engine proper. In fact it gives him a complete practical knowledge of the application of many branches of science.

Another one of the important things is that it keeps him in the fresh air and sunshine and gives him plenty of physical activity, which other hobbies do not do. We think every parent will recognize the value of a hobby which absorbs the complete attention and interest of any young man. One of the common phrases expressed by parents is: "I don't know what I am going to do with my boy." Gas model building and flying is the answer to this.

This art is a powerful factor for developing young men into intelligent citizens. The fact that they compete and associate with one another will be a great influence to help them cooperate with their fellow men later in life.

The most important fact of all is the intensity with which this art holds the attention of all participants in it. Gas model builders usually are not "lukewarm" in their interest, but are thoroughly "wrapped up" in it. After all we believe that this fact alone will be the cause of the downfall of anyone who lacks the wisdom to attack gas model activities.

The arguments used against gas model flights are:

1. A menace to personal and private property.

2. A hazard in the home, due to the fact that it is necessary to have gasoline in the house.

3. Gas model builders absolutely disregard laws governing personal rights and property.

4. They are a hazard to planes which may be flying over the spot where gas models are operating.

Let us look at these points and see what their value actually is. In the first place, it is based on the premise that gas model builders build and operate planes promiscuously, without any consideration for people or property and without any supervision or restraint whatsoever by law abiding citizens and those who understand the art thoroughly. Obviously this presumption is untrue and it appears that it is the result of a lack of knowledge of gas models and of the extent to which this activity is carried on.

Let us consider the damage to people and personal property. Up to the present time there have been thousands of flights made and hundreds of contests have been held. At the recent IGMAA Eastern States Contest there was an attendance of over 3,000 people and 800 automobiles. 275 contestants took part. As many as seven or eight planes were in the air at one time and yet at this contest not one person received an injury. One plane did fly into an automobile and cracked one of the windows. However it did not hit with sufficient force, though it was in full flight, to shatter the windows. Obviously people would be hurt if gas models were flown in a crowded city or in a district which was congested and people were unaware of their approach. However gas models are not flown in crowded districts.

One of the things which absolutely discourages the builder from flying in locations of this kind is the fact that their models will be damaged if they hit any object or come in contact with traffic. It is to the advantage of the gas model builders, and they usually follow this course, to fly their models in cleared spaces, such as at open fields or airports at which they have permission from the airport manager to operate their planes. In most cases airport managers have cooperated to the fullest extent and have kept the flying under their careful surveillance. In fact every official of the IGMAA and every member wishes to obey the laws of safety in connection with their flying so as not to bring down the wrath upon their heads, of those who wish to discredit and suppress gas models, or leave any way open in which they may be criticized.

Models flown from airports and open fields as a rule do not fly into crowded cities or districts. Another fact which prevents this is that at contests and in practice flights a limited amount of fuel is used or timers are used which limit the engine run. Ob-

(Continued on page 57)





# A Record Hydro Fuselage Model

How You Can Build a Reliable Over Water Flier That Will Make Vacation Days More Enjoyable

By ALAN ORTHOF

LATE in August, 1936, record trials were held at Van Cortlandt Park for seaplanes.

The day before the trials, I decided to try out for the record. I took a fuselage model that had given good performance as a landplane, and equipped it with a pair of very simple floats.

About 5 o'clock I took the plane over to one of the lakes at Central Park. After gliding the model a few times to get the proper adjustment, the rubber was wound up about 500 turns and the model was placed on the water.

Upon releasing the propeller the ship taxied about 12 inches and shot up into the air circling gracefully. After 4 min. 20 sec., the model stuck in the top of a large tree. By the time the ship was retrieved it was too late to make any further flights.

On the day the trials were held the weather was very bad with wind and rain hindering our flying. About two o'clock, without any improvement in the weather, I decided to fly the ship. With about 600 turns in the rubber the model was set on the water. The ship took off slowly with none of the zip it showed the day before. After circling for about 45 sec., it glided in for a landing making the time of 1 min. 7 sec., establishing the record.

Although the time was not half as good as expected, under the prevailing conditions I was not dissatisfied with the ship, for the next day it was lost from sight after a time of 7 min. 3 sec.

Now let us start construction.

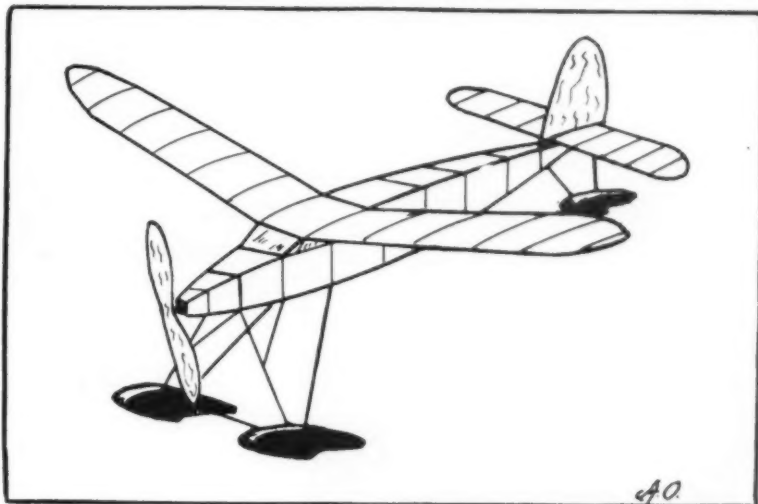
## Fuselage

This is constructed completely of  $\frac{3}{8}$  square hard balsa.

Draw the fuselage out full size on a large sheet of paper. Lay a piece of wax paper over the plan to prevent the framework from sticking to it. Pin the  $\frac{3}{8}$  square strips to the plan and cement the upright braces in place. When dry, remove from plan and construct another side exactly as you did the first. When both sides are dry, assemble them by cementing the cross braces in place as in top view of fuselage. Now bend rear hook from No. 040 wire and cement it to the rear former as shown.

## Wing

The first step is to make a template of the rib section. This is made by tracing the rib on a piece of thin tin. Cut the tin to shape and smooth it off with a file. Now using the template, cut 21 ribs from medium 1/32 sheet balsa. Now draw up the wing full size and pin in place where



How your model will look when it is completed

shown. Cement ribs in place and attach 1/20 sq. bamboo tips in place. Allow time to dry. Next crack the spars at the center section where shown and place 3" dihedral under each tip. Cement firmly.

## Tail

The rudder is cut from soft  $\frac{1}{8}$  sheet and sanded to a streamline section. The stabilizer is constructed in the same manner as the wing, except that there is no dihedral added.

## Floats

The floats are very simple in construction. First cut 4 sides from  $\frac{1}{8}$  sheet for the main float and 2 from 1/32 sheet for the tail float. Now assemble the sides as you did the top view of the fuselage.

## Landing Gear

This is bent from No. .040 wire and completely encircles the fuselage at the section shown. Bend the axles at the end of the landing gear as you would for wheels. The bamboo brace is added later.

## Propeller

The propeller is carved from a block of hard balsa  $1\frac{1}{2} \times 1 \times 10$ . Taper block as shown. Carve the rear of the block first and in about  $\frac{1}{8}$  inch cup. Now carve the face; when finished sand smooth with fine sandpaper.

## Covering

The fuselage is covered in four sections, top, bottom and the two sides. Attach tissue to framework with banana oil. Spray fuselage lightly with water and allow it to dry thoroughly. This removes any wrinkle in the tissue. Now apply 3 coats of banana oil; this will protect the tissue from spray. Wing and stabilizer are covered in the same manner. The floats are covered on all sides with a double coat of tissue and are given 2 coats of cement and 2 of banana oil.

## Assembly

Cement firmly a piece of aluminum tubing to the top of the main floats as shown. Now insert the spreader bar of bamboo between the two floats.

Next cement the wire landing gear securely in place and attach the floats by sliding the axles through the tubing. Cement the bamboo brace in place. Cement rudder in place on top of stabilizer and attach to fuselage with rubber band. Wing is attached in the same manner. Put nose block and prop in place, slide 10 strands of  $\frac{1}{8}$  flat brown rubber in place and the model is ready to fly.

## Flying

Glide the model a few times in some high grass to protect the floats. After the right adjustment has been found, wind the rubber up about 400 times and set the model on the water, release the prop. The ship should take off and climb gracefully and finally glide to a perfect landing. Now put about 900 turns in the rubber and prepare yourself for many pleasant surprises.

## To All Model Builders

Every builder of rubber power models, at some time will wish to try his hand at gas model building. His preparation for the study of aeronautical engineering or as an expert in aviation matters would not be complete without building a gas model; a complete miniature airplane that flies. Such a model gives practice in solving the problems of design that are characteristic of large planes.

Therefore DO YOUR PART to combat the enemies of Gas Models. READ THE EDITORIAL ON PAGE NO. 7



The Lockheed sub-stratosphere plane designed to fly six miles "up" and to withstand heavy internal pressure. (Acme)



One of the latest sleek Junkers high speed transports, powered with two Diesels



View of the monster Boeing super-bomber from which you can get some conception of its size. (G. S. Williams)



A good argument for airplanes. The Hindenburg descending in flames at Lakehurst, N.J.

# On Frontiers

Startling Facts About Transport Planes That Soon Will Be Plying the Skies

By ROBERT C. MORRISON

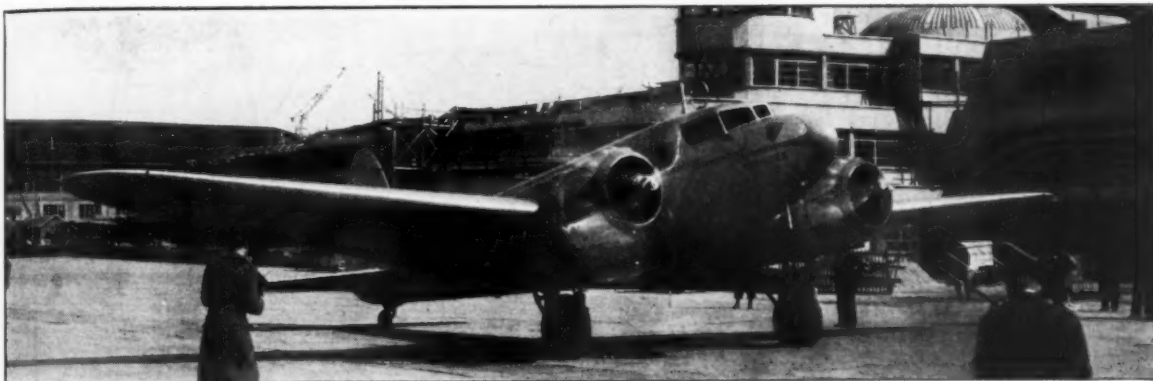
THE case of the giant airplane is before us. It has been before us previously in its many experimental stages—and how experimental they were! However the huge airplane this time will lead our more permanent life with steady advancement; more so than formerly. It is the natural tendency of a human being to do bigger and better things and this is true of the aviation industry in particular. No sooner was the first airplane flown than builders began to construct larger ones. One of the first pilots to fly these early "giants" was Mr. Otto Timm who is still a prominent figure in the aviation industry. In spite of the fact that his ship had three engines it was underpowered and he had to wait for a strong wind before the plane could be taken off the ground. However, nature provided a small gale for Mr. Timm without much

delay and thus the first test flight was attempted soon followed up by a resounding crash and a flying of splinters as the ship, with its already small quantity of horsepower diminished when an engine failed, picked out the nearest house and made contact. Fortunately Mr. Timm came out without a scratch. During the tri-motor's short period of time in the air, its pilot found that it could not be turned which was of course a contributory factor that led to the crash, the first one to take place at the then new Clover Field, home of the Douglas Aircraft Co.

This was one of the first of many crack-ups and as one might say, "started the ball rolling." The larger the planes were built the harder they fell. Designers of big aircraft seemed to get ahead of themselves. One outstanding and rather humorous example was a huge 100 passenger flying boat built by a well known Italian company, the Caproni concern. This ship had two rows of wings in tandem fashion mounted atop what looked like Mr. Caproni's old houseboat, a sort of flying "Robert Fulton" or surrealism at its height. Engines were scattered about here and there for propulsive purposes, and on its first attempted flight it went as far as the nearest sand-bar where it lodged itself permanently—or that is its



The new giant Boeing XB-15 Army super-bomber just completed after 3 years of work. (G. S. Williams)



Arrival at Le Bourget Field, Paris, of the first plane of the new Italy to France airline. (Keystone)

# Of Aviation

How You Can Build a Solid Scale Model of the U. S. Army Northrop A-17 Attack Plane

Drawing By DON MERTENS

builders decided it would be permanent and thus 100 lives were spared. This plane was certainly the giant of giants.

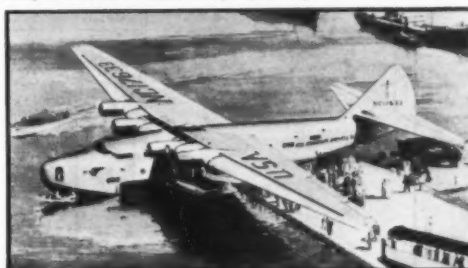
Other huge airliners of which we are more familiar are the DO-X type of which three were built and would add considerably to anyone's expense account. Then there was the still more recent Lieut. de Vaisseau de Paris which competed against a hurricane at Miami and lost. The last of Anthony Fokker's huge four-engined F-32s is now doing well as a novel gas station in Hollywood. Keystone's "Patrician," a large tri-motor, ended a short but illustrious career in a swamp and the Maxim Gorky accident was the greatest air disaster ever to occur.

Along with the swift progress of aviation has come the knowledge of how huge airplanes should be built. Those now in the process of construction, of which there are many, will be wonderful airplanes and with their powerful engines will be able to climb to great heights and circumnavigate storms. They will increase the safety of flying one hundred percent.

Until one thoroughly considers the number of new and proposed airliners does the figure seem alarming. Contained and compiled in this article is information that has been obtained from various sources on new enormous airplanes that we will see within the next few years. Since the builders are reluctant to give out much information on their new airplanes until they have been successfully test flown, it has been difficult to gather any very authentic details. The accompanying facts

are as accurate as is possible under the circumstances and should give you an excellent idea of the progress now being made in the design of large aircraft. Comparison of the airplanes in the table on page 62 is very interesting. The information of the Martin flying boat with the 180 foot wingspread has been made public by Glenn L. Martin as what he considers will be the specifications of one of the future flying boats. Whether he will actually build one according to these figures is not known but it is highly probable. However we may see his 157 foot boat before autumn. The Martin four-engined landplane may or may not be built. The company has undertaken much development work in stratosphere flying of this type of plane and will certainly build some sort of land transport in the near future.

(Continued on page 42)



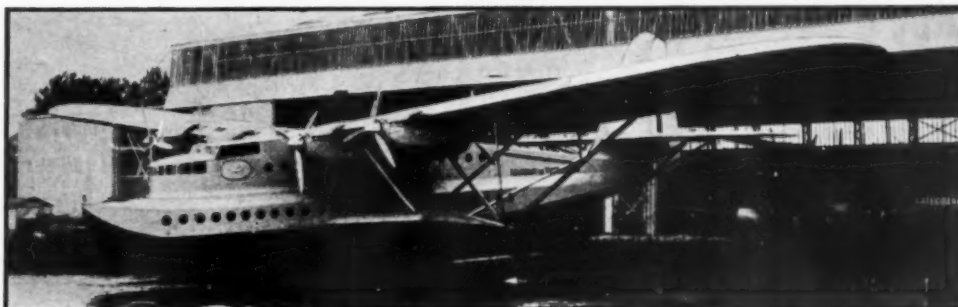
The new 6000 hp. Boeing super clipper flying boat that will soon fly the Atlantic. (International)



The Lockheed Sirius stratosphere plane in which Clarence Chamberlin intends to fly the Atlantic. (Clark)

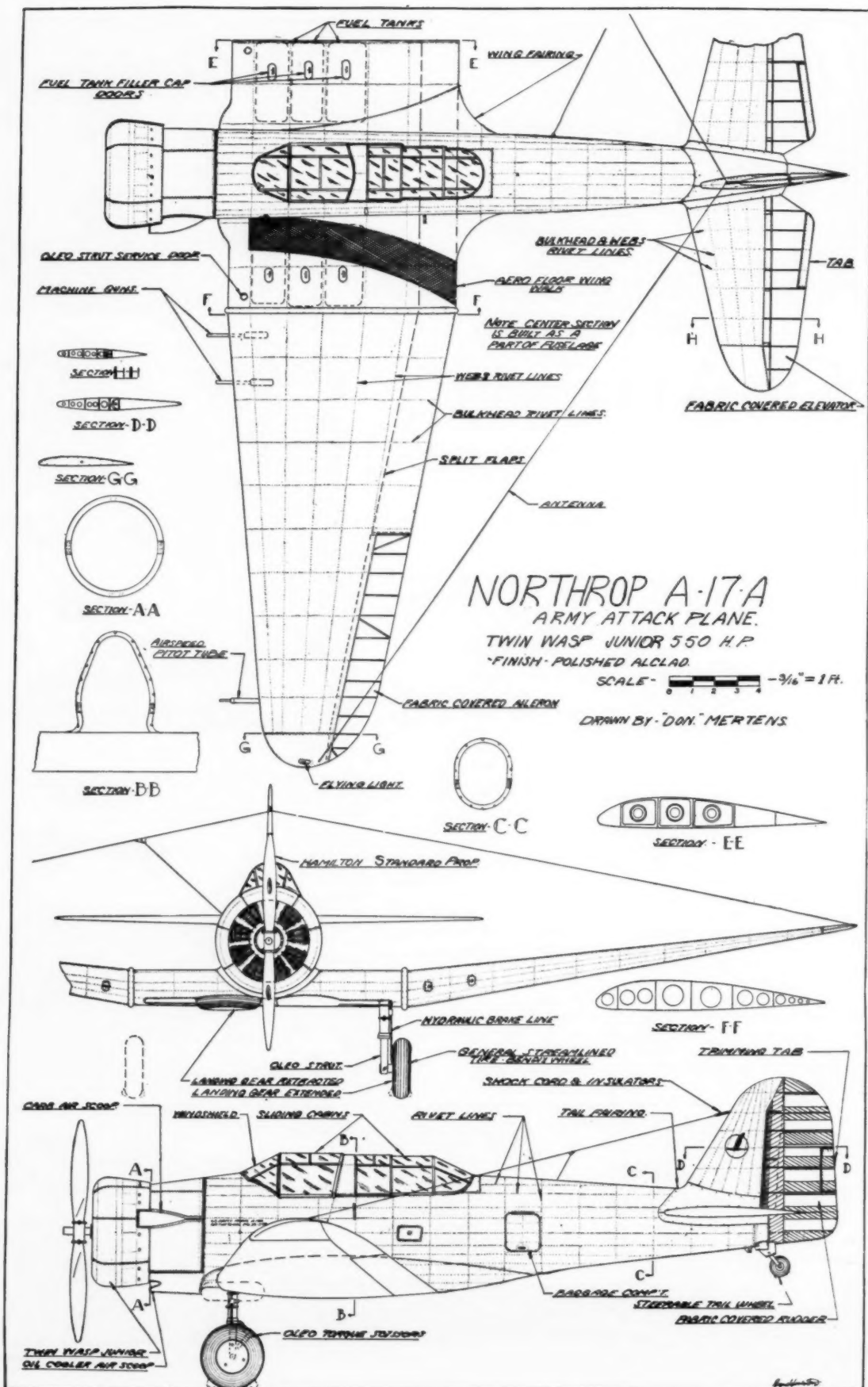


Four-motored Russian bombers going places. (Sovfoto)



The 70 passenger flying boat Lieut. de Vaisseau de Paris, ready to fly again after being wrecked in a hurricane at Pensacola, Fla., last year. (Acme)





# Model Builders Hall of Fame

MAXWELL BASSETT

By PHILIP ZECCHITELLA

IT WAS the day before the gas event at the Detroit National Meet when the word was passed. Through the corridors of the luxurious Book-Cadillac Hotel, up to the workroom, and down to the registration desk, sped the message.

"Bassett is coming."

And that was all. Although, we should say, that was enough. The next morning the gas models were being transported to the field but still the queries persisted.

"Is he coming?"

"Yeah, he'll be here, don't worry!"

At two in the afternoon, at spacious Wayne County Airport, the grapevine communication tersely passed the message:

"Bassett isn't coming!"

A crisis seemed to have passed. A new life leaped into the tiny engines. Gas model novices hurried repairs to their models. Old timers spoke:

"Stick your motor in with tooth-picks, pin your wing on, put the rudder on with a thumb-tack, but *fly* it!"

It is not a secret that Bassett is considered a triple threat at a gas model contest, or at least they don't keep it a secret very well. His record certainly speaks for itself. The only gas model meet in which he did not win first prize was the St. Louis Texaco event, but for good reasons. And yet, how can we explain this phenomena. Originally it was credited to Maxwell's superior knowledge of the tiny engine that carries his models aloft. At that time this assumption might have been entirely correct for the big problem was how to start the engine and to keep it going after it had started. Maxwell's consistent knack of getting his engine to start practically put him in a class by himself, but it was not for long until the boys became familiar with their tiny power plants, when little or no trouble was experienced in starting the engines. However, Bassett still continued to walk away with top honors at the gas model meets. Then it became evident that his skill was more than, shall we say, engine deep.

If one were to line up the contestants at a meet, and try to speculate who would win by noting their outward personality, Bassett would certainly be eliminated first off. His appearance is not heralded by the usual "blowing" and other talk invariably resorted to by other enthusiasts when referring to the relative merits of their models. He has an air of shyness and conveys the impression that this is his first contest. (A little careful observation when Bassett is adjusting his model would soon remedy that impression, however). To look at the line-up and judge Bassett one would say, "Mmm. He won't win."

Now let us suppose all the models were put on the line, and they will range from every description; streamlined, monocoque, parasol, and cantilever. A beautifully constructed model would be seriously considered. Others, with much care devoted to their finish, glisten in the sun. Bassett's model, however, is distinctly a gawky looking craft with its nose pertinently perched skyward and with its wing jauntily riding almost a foot above the fuselage. An aerodynamic analysis of the model would show its superiority immediately, but to judge by appearance one would again say, "That model? Mmm. *That* model won't win!"

And yet, Bassett flies his model and "Mmm. They *do* win!"

Explanation? Well, let us ask Bassett himself.

"I test a new model for stability first by gliding it. Later, I fly it with gradually increased amounts of power. It requires an average of six months to build a model, and it takes me about a month to prepare for a contest properly. That consists of test-hopping my planes many times and repairing or improving the construction."

Which makes his prowess practically no secret at all.

Bassett is twenty-two years old and was born in Philadelphia. At present he is a junior at the University of Pennsylvania where he is studying mechanical engineering. His model building career started in 1927 when his interest was aroused, or stimulated, at any rate, by the model airplane feature articles in boys' magazines. His supplies were obtained through the Airplane Model League of America. Spruce and balsa were mostly used. His first model was a tractor with a twenty-inch wingspan covered with Japanese tissue.

"The most difficult part," he says, "was to make the propeller which I succeeded in carving only after hacking all my fingers and losing my temper a number of times."

The model, when completed, flew thirty feet and landed in a clump of bushes. There were numerous holes in the wing of the model, but Bassett forgot to tell us what happened to the bushes! His greatest disappointment came when a new rule was adopted which specified that no parts of a model could be dropped off while in flight. Up to that period he had been working on a ship which had two distinct sets of motors. After a steep climb, the model would level off and drop its heavy motor, then continue on under power of a very light rubber motor, with just enough thrust to keep the



Maxwell Bassett

model in level flight. He had hoped to take this to the National Meet in 1930 but was very much discouraged when the new rule was issued.

Just how many models he has built is a figure that has never been accurately established but a conservative estimate places the amount at about one thousand models, twenty of which have been gas models. We should say that in addition to being a sport, this last revelation makes it practically a career. His workshop, which is about twelve by twenty feet, is piled at least two feet deep (except around the work bench) and models decorate all available wall space. Most of his work is done while on vacation or whenever he feels that his models need him more than his teachers.

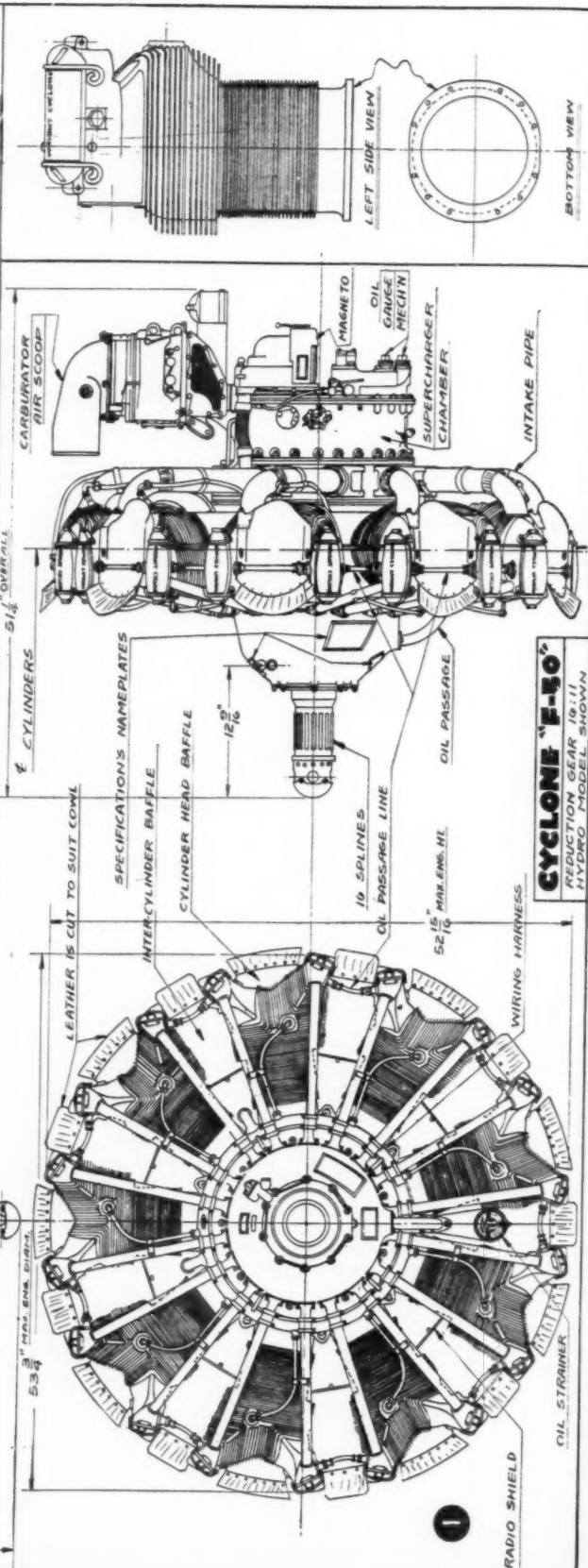
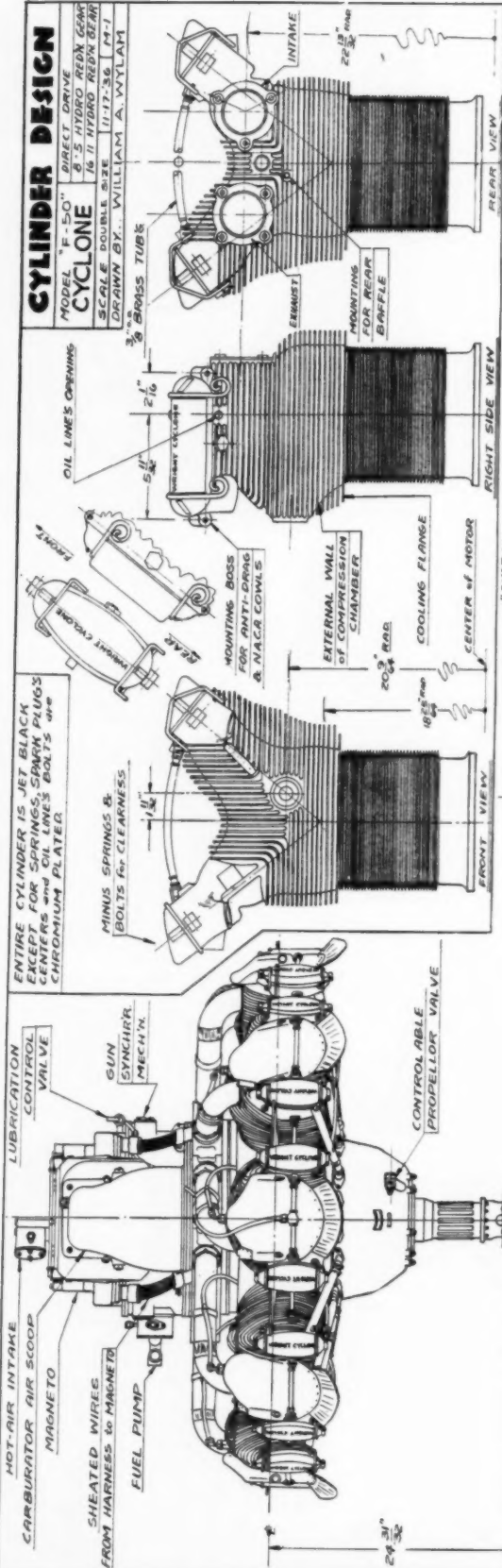
His first gas model did not fly. In fact, it was not until his sixth model that he obtained what could really be called a good flight. His first plane had a four foot wingspan and weighed about two pounds. It was only a stick model and was built of approximately the same materials as those of today. The worst problems he encountered on his early gas jobs was that of stability. Next to this was the problem of correct size, weight, and construction. As there was no available information on the subject at the time, it amounted to quite a predicament. On the subject of safety, he feels there is no existing danger in gas model flying. If proper rules are made and precautions taken, there will be no reason for considering the sport a hazard. He has been very fortunate in getting back all of his models which at one time or another have flown out of sight, although some of them have been lost for as long as three months.

His continued interest in models, he believes, is largely due to competition. His first contest was in 1929 at a Philadelphia airport. His entry was a twin pusher ("and those propellers had a lot to push!"). Since then, he has entered between sixty and seventy contests, including the 1932, '33, '34 and '35 Nationals, and has placed in approximately 90% of them. The first prize he ever won was a second place rib-

(Continued on page 54)

# **CYLINDER DESIGN**

MODEL "F-50"  
CYCLONE  
DIRECT DRIVE  
8-5 HYDRO REDN GEAR  
16-11 HYDRO REDN GEAR  
SCALE DOUBLE SIZE 11-17-36 M-1  
DRAWN BY: WILLIAM A. WYLLAM





# The "F-50" Cyclone in Miniature

Interesting Phases of the Development and Construction Details of This Famous Engine and How You Can Build a Model of It

By WILLIAM WYLAM

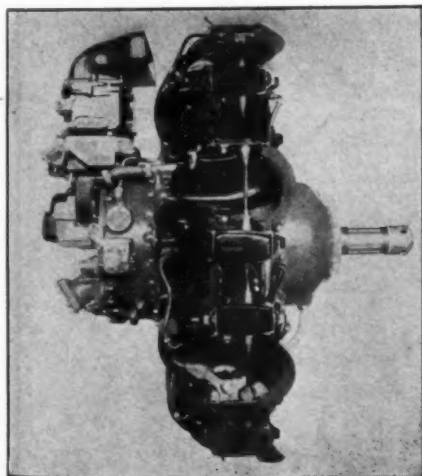
## History of the "F" Cyclone

THE Wright Cyclones are building up an enviable reputation since their first design was created in 1924. It was the first built job for the Navy order, which was to replace the obsolete and worn out Liberty engines in the Navy patrol boats. Since then, the Cyclones have progressively developed from 420 horsepower to the rating of 820 horsepower as shown in the "F-50" models; recent developments have boosted the horsepower rating to over 1,200!

The different models which have successfully marked each stage in its development, are widely used by the United States Army and Navy; by foreign governments throughout the world and by various commercial air lines. The Cyclone's greatest contribution to the truthfulness of its reliability was shown by its achievement in powering the high speed Martin Bombers on the mass flight to Alaska, from Washington, D.C., and return.

The Cyclone engine is used in the most recent and advanced types of military and commercial airplanes because of the lightness per horsepower, its simple mounting system and its instant reaction to the operator's touch. In the commercial field, Wright Cyclones power the majority of latest highspeed transports.

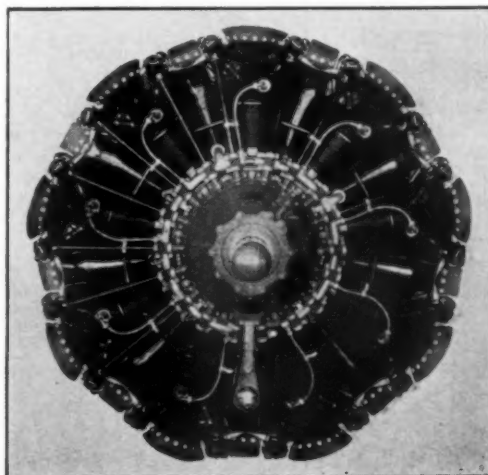
Lindbergh flew the Atlantic with a Whirlwind, a small version of the cyclone.



Side view. Note carburetor at rear

## Description of the "F-50" Cyclone

Fundamentally, the design of the "F-50" follows closely the original model from which the "F-50" was developed. No change has been made in the basic design; and all its parts are interchangeable. By substituting supercharger drive gears of a lower or higher



Front view showing cylinder arrangement

ratio and by altering the carburetor settings correspondingly, the performance characteristics of any series may be adapted to desired operating conditions.

Five major refinements are incorporated in the "F-50" models to produce higher power outputs, both at sea level and at higher altitudes. The refinements are the dynamic damper, controlled pressure lubrication of the valve gears, a new cylinder head, specially hardened cylinder barrels and improved supercharger unit.

The dynamic damper incorporated in the crankshaft assembly is a device to permit a smoother operation never attained before in any radial engines. Also this counterweight removes engine speed restrictions.

The controlled pressure lubrication of the valve gear system employed on the "F-50" brings all parts of the engine under lubrication from the main oil system. Complete control of the lubrication oil entering the system is provided by a manually



A rear view of the "F-50" Cyclone

operated (hand) valve on the main oil pump. By opening this valve for 15 seconds or more the entire mechanism is lubricated and this system eliminates the removal of engine cowlings, reduced maintenance and does away with the external lubrication equipments.

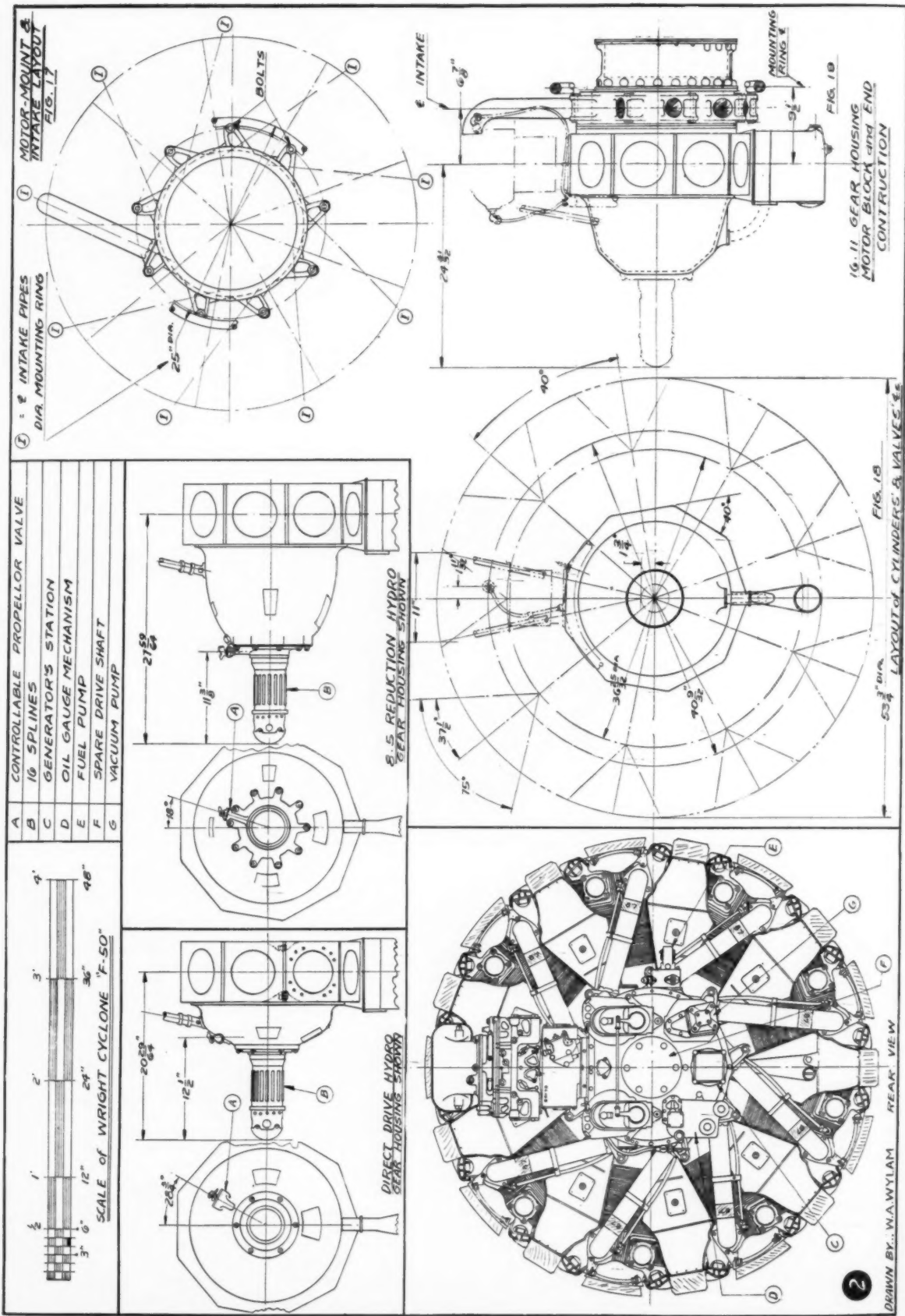
The cylinder heads are built up in accordance with standard Wright practice; aluminum alloy heads are screwed and shrunk on to the alloy steel barrels and are fitted with an ingenious system of pressure baffles. The rocker support boxes are cast whole and are machined to the desired finish. Both exhaust and intake ports are located at the rear of the cylinders. The exhaust ports are provided with four studs instead of two. This permits a more rigid attachment of exhaust pipes or manifold units to the cylinders, increasing the life and power of the engine. The exhaust valves have sodium filled heads and stem to help decrease the heat at the valve heads. The exhaust valves are "faced" with Stellite and these valves have stainless steel seats.

The cylinder barrels follow the same design as the first series. They are machined from alloy steel forgings and are threaded on the upper ends for attachment to the cylinder heads. The barrels are treated to a special process that will give them an exceptionally hard surface on the inside.

The cooling systems of the cylinder heads and barrels are by the use of inter-cylinder baffles and cylinder head baffles, which are made of pressed steel. This baffling system insures a smooth flow of air over all portions of the cylinder heads and barrels and permits the uniformity of cooling. The inter-cylinder baffling directs the cooling air to the rear of the barrels while the head baffles force the air to flow around the contour of the cylinder head to the rear spark plugs. On the rocker support boxes, lugs are provided for attachment of ring, anti-drag cowl or full NACA cowl.

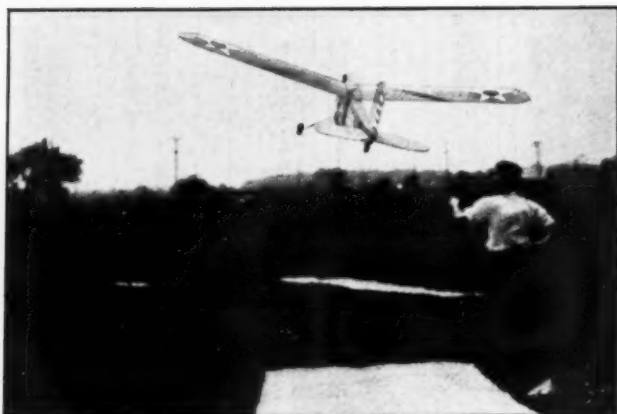
The supercharger unit has an eleven inch impeller installed in the supercharger

(Continued on page 44)









Thomas Schisano's perfectly designed job taking off



Ben. Shereshaw loads up a gas tank while Joe Kovel looks on with a critical eye. The KG is not Joe's



Mr. Irwin Polk presents the Polk Trophy to Robert Gabler, winner in the limited engine run event



Mr. Ben Shereshaw presents the S. S. Kresge Trophy to Franklin Kral for greatest duration



Franklin Kral's winning model with a dishpan cowl, that flew 20 m. 46 s.

# "Gas Lines"

What Happened at the Annual I.G.M.A.A. Eastern States Contest, the Largest Contest Ever Held—News of the Units



The I.G.M.A.A. Pin

Read the Editorial on Page 7

THINGS of great moment are happening in the gas model airplane field. Forces opposed to gas model activities are endeavoring to suppress interested fans from flying this type of ship. They have gone so far as to endeavor to have restrictions passed which will do untold damage to this activity.

The IGMAA was started in order to promote gas model activities and to prevent any

one from trying to suppress it. Therefore we call your attention to the editorial on this dynamic subject on page 7. Every IGMAA member should read it thoroughly and take action accordingly.

## IGMAA Eastern States Contest

By far the biggest thing outside of this attack on gas models is the IGMAA Eastern States Contest, which took place at Hadley Field, New Jersey, on May 22nd. This contest was the biggest gas model contest ever held. 275 contestants were present with over 300 gas models. Though the contest was not intensively publicized, 3,000 people came from various sections in about 800 automobiles. This created quite a problem for the police. However preparations were made beforehand for taking care of a large crowd and little trouble was experienced in handling the situation.

The meet was sponsored by the S. S. Kresge Department Store of Newark, N.J., and was supervised by the head office of the IGMAA and MODEL AIRPLANE NEWS. The field was donated for the contest through the courtesy of Mr. Thomas W. Robertson, Manager of Hadley Aircraft, Inc. This is the third time that Mr. Robertson has turned over the field for the use of a major IGMAA contest. We consider his action a great contribution to the science of gas model planes and to the



Mr. Edward Roberts presents the Jr. Motors Trophy to Thomas Schisano for the most perfect plane development



A small part of the crowd at the contest and officials around fueling and weighing tables

pleasure of the model fliers who took part. The sponsors, the S. S. Kresge Department Store, provided elaborate equipment to carry on the contest. This contributed materially to its success. The field was well roped off and enough booths were provided for the contest in which they could keep their planes, tools and other equipment.

Mr. Charles Grant, director of the IGMAA, directed the contest. Under him were sub-directors in charge of each major function; that is, recording, weighing and checking the models, and fueling. Mr. S. Block of New York City was voted the most intensive worker at the contest. All day long he was busy in the hot sun without a moment's rest registering the contestants and recording the times. He was assisted by three other industrious gentlemen. Mr. Benjamin Shershaw, director of the Kresge Department Store Gas Model Club, Unit No. 2 of the IGMAA, was in charge of the fueling. Mr. Irwin Polk, leader of Unit No. 7, the Metropolitan Model League, was in charge of weighing in the models. Mr. Nathan Polk, supervised the run-ways and take-offs of the models. Each one of these sub-directors had very able men to help them, some of them also acted as timers. The IGMAA wishes to extend its greatest appreciation to the following gentlemen who were of such aid at the contest:

Messrs. Ed Landry, Dick Landry, H. L. Keyes, all of New York City, Carl Eld-

Activity at one of the run-ways. The movie men hope to get a crash shot to "thrill" the public. They didn't seem to get the spirit of the contest

Earl Sleep's Red Zephyr that pleases the crowd by towing an advertising banner

redge of Haddonfield, N.J., Sherwood Castles, S. Block of New York City, Fred Kunzman of New Brighton, N.Y.; William Bouldin of East Orange, N.J., Percy Daniels of New York City, Carl Schmaidig, Salem Barrack of Harrisburg, Pa., Irwin and Nathan Polk of New York City, Henry Hohner of Newark, N.J.

The commanding officer of the U.S. Army was kind enough to send a detail of men to the con-

Ted Kaiser, who won 3rd place in the limited engine run event



Frank Gerstenmier's unusual plane that won second place in the Junior Motors contest for most perfect development



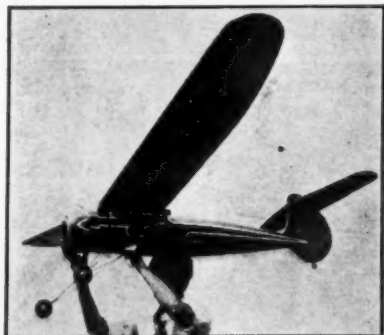
The biggest plane on the field and its builder, Martin Nemerofsky. It had a 12 ft. span and weighed 6 1/2 lbs.



Bert Schiffman and his aluminum sheet covered mid-wing gas job. It weighed only five pounds and flew well



Don Damasch and his ship that placed second in the limited engine run event



Thomas Schisano and his model that won the Junior Motors Trophy

test to act as timers. They were invaluable and contributed extremely to its success with their accurate timing. Fortunately the weather was perfect, though the weather bureau had prophesied rain.

The contest got off to an auspicious start about 10 o'clock. As soon as the model builders were registered and their ships checked and fueled, flights started from the run-ways. In the morning the Limited Engine Run Event was scheduled. The flying in this event lasted until 1 o'clock. The motor was allowed a forty second run. The time of this run on most of the ships was controlled with timers which were purchased, though some were home-made. Others were so adept at judging the length of time that their engines would run with a certain amount of fuel that timers were not necessary. As many as seven ships were in the air at one time during this event. The usual thrills resulted from unfortunate crashes, though these were in the minority. Each succeeding contest indicated that gas model builders are more expert in designing and flying their ships.

At the end of the event it was found

that the winner was Robert Gabler of 244 North 11th Street, Reading, Pa., who flew his ship for 7 minutes, 20 seconds. Gabler won the Polk trophy which is a perpetual trophy given by the Polk brothers at the annual IGMAA contest held in May. The large trophy is to be passed on to a new winner, while the old winner retains a twelve inch miniature. This trophy was a very beautiful award and consisted of a cylindrical shaft of gold-bronze. The other winners were:

Daniel Damasch of 307 East 86th Street,



Margaret Taggart, one of the two female contestants, with her well-built ship

New York City, was second with a time of 7 minutes, 5 1/2 seconds. He received as an award a Baby Cyclone engine given by the Kresge Department Store IGMAA unit. Mr. Shershaw was largely responsible for this donation. Third place went to Theodore Kaiser of 49-03 O'Connell Street, Elmhurst, New York, with a flight of 6 minutes, 38 1/2 seconds. He received a Comet Curtiss Robin gas model kit. The Comet Model Airplane & Supply Company was kind enough to donate this prize towards the success of the contest. Fourth place was

won by L. E. Teuch with a flight of 3 minutes, 57 1/2 seconds. His prize was a Comet Curtiss Robin gas model kit, given by the Kresge Department Store. The address of this young man is unknown and no record was made of it at the contest. It is requested that he write in immediately and send us his address so we can send him his prize. Also, he should enclose his IGMAA membership card for verification. Fifth through ninth places were awarded to:

Franklin Kral, 1814 Kilbourne Place N.W., Washington, D.C., with a time of 3 minutes, 56 seconds; Linden Model Airplane Club of Linden, N.J., with a time of 3 minutes; Arthur Friedman of 1656 East 21st Street, Brooklyn, N.Y., who had a flight of 2 minutes, 37 seconds; Thomas Kapral of 7339 Bingham Street, Philadelphia, Pa., whose time was 2 minutes, 25 seconds and C. Hain of 1137 Locust Street, Reading, Pa., whose time was 2 minutes, 5 seconds. The prizes were a subscription to MODEL AIRPLANE NEWS and gold medals respectively.

(Continued on page 58)



One of the smallest models at the contest, and its builder, Paul Plecan



Lawrence Teuch, the youngest contestant, age 14, with his "Miss America"



Frank Zaic is pleased with the tail arrangement of John Tsagaris' model



An interesting balsa-covered model of refined design and its builder (No name given)



# Building "Little Tick"

A Simple and Efficient Timer for Gas Models That You Can Make Easily  
From the Works of a Clock

By JAMES F. CONDON

EACH year we model builders are faced with some new problems which keep us going until we not only solve them but develop them until they are almost perfect. For the past few years it has been gas models.

First it was the development of the little motors. Then, when the engines had progressed to the point where any model builder with the necessary cash could purchase any one of several makes of dependable motors, there arose the problem of designing the planes to hold them.

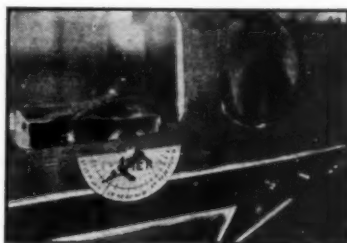
Now, after many successful designs have been worked out, this year's problem will be that of getting the model to come down in the same town from which it took off.

This means that some method of control has to be developed.

Since radio control is still too impractical with present day motors, the only thing

left for us to do is to control the motor run.

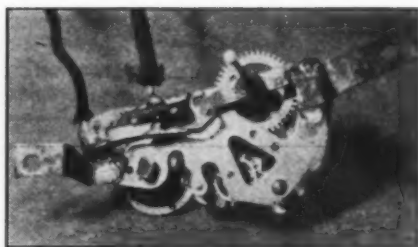
The method used to accomplish this must be positive for an unreliable timer may cause the loss of your plane, or, if the plane is being flown in a contest, it may cause disqualification.



The timer installed in a gas model, showing the timing dial



The works of a clock made into a timer



The timer, showing the ignition lead wires through which the motor ignition is shut off

Limiting the supply of gas will surely bring the ship down, but it has two drawbacks. First, and the one that most builders agree on, is the fact that a balky motor may use precious fuel in warming up and cause the motor to cut on the take-off. The small amount of gas in the tank may slosh about on the take-off letting air into the gas line causing the same thing.

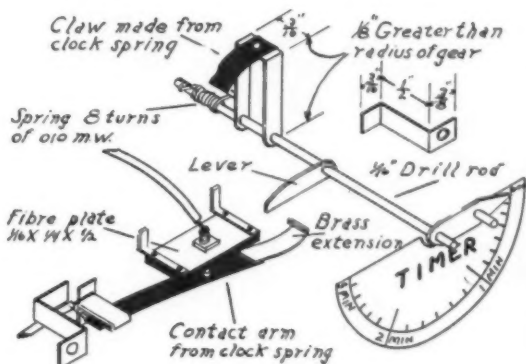
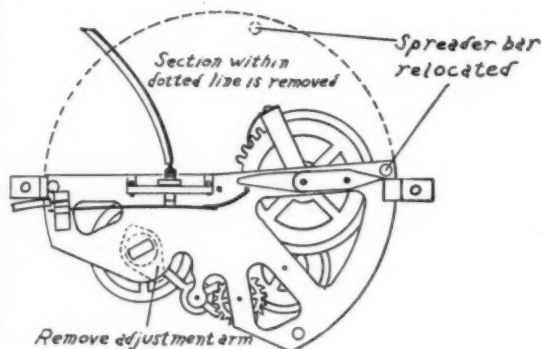
Then there is the undesirability of having to fuel up your ship before each flight.

A more satisfactory method is that in which the ignition circuit is broken by mechanical means.

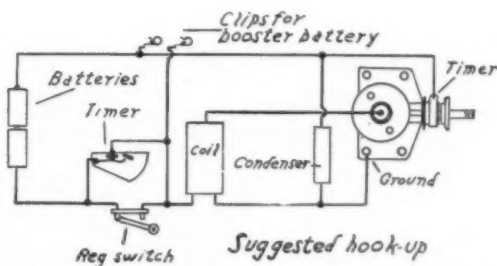
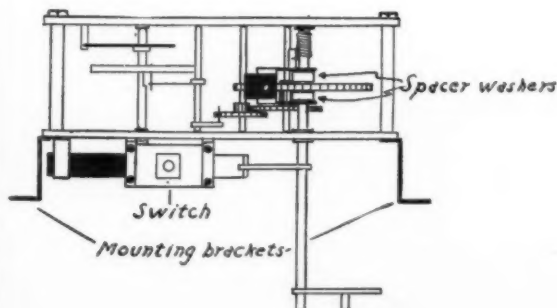
These timers should also be fairly accurate; that is, they should not speed up or slow down once they have been calibrated. They should be simple to operate and also very light in weight.

A number of model builders have successfully used camera timers to cut their

(Continued on page 50)

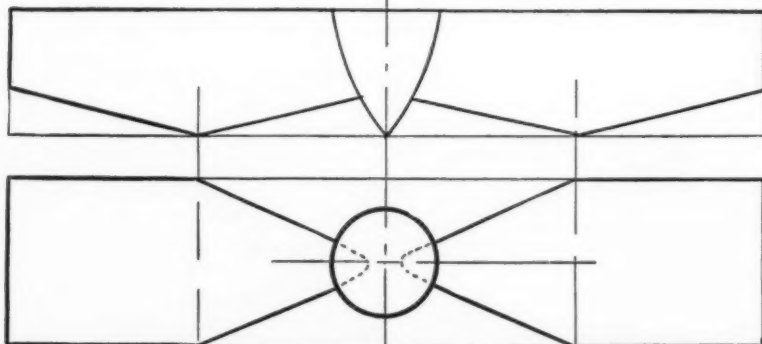
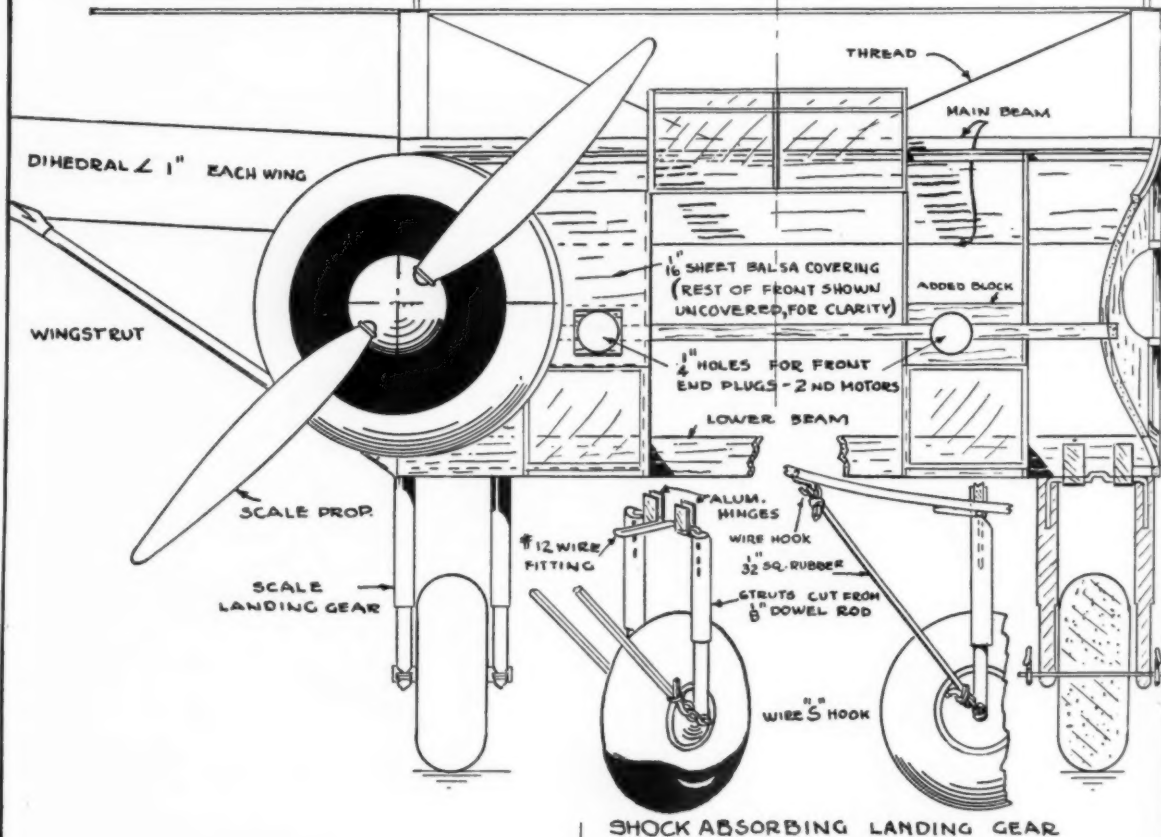
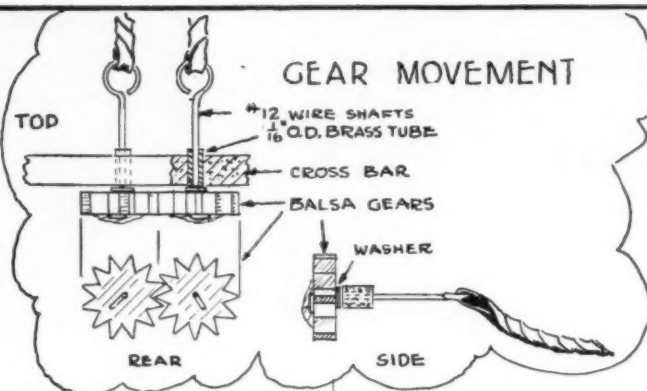
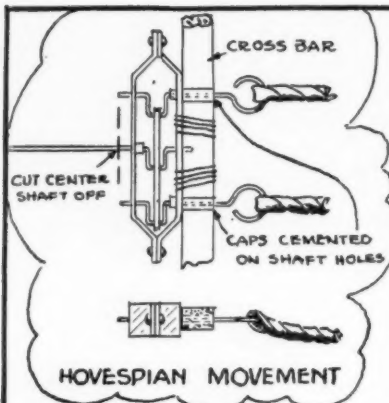


View showing parts added to Clock only



Suggested hook-up

**LITTLE 'TICK'**  
Designed By J.F. Condon Jr



BALSA BLOCKS  
3/4" x 1" x 4 1/2"

1

CARVE MATCHED PAIR - ONE LEFT, ONE RIGHT.



The finished model showing the "lifting" fuselage and other distinctive features

# Build This Flying Burnelli Transport

THE unusual design and safety features of the Uppercu-Burnelli all-metal 14 passenger transport have caused favorable comment both in the U.S. and abroad.

The ship resembles a huge flying wing and the airfoil-shaped fuselage tends to carry its share of the load. The two 725 hp. Pratt & Whitney engines are mounted on opposite sides of the leading edge of the fuselage, at angles away from each other to counteract the opposing drag caused by flying with one motor. This feature is included on the model, while the retracting gear and wells are omitted for simplicity.

## Specifications and Performance

Cruising speed at sea level.....	185 m.p.h.
Max. speed at sea level.....	210 m.p.h.
Span .....	71'
Length .....	44'
Height .....	10'
Weight empty.....	8000 lb.
Pay load.....	3200 lb.

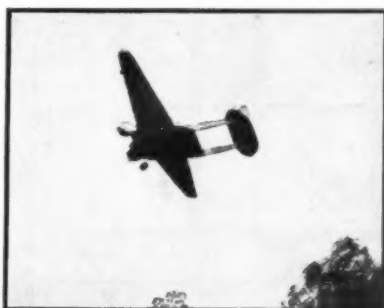
and has a cruising range of 600 miles. The model passed through several stages of experimentation before the present systems of powering were adopted. At the beginning, single motors were applied to each propeller, but the duration was too short. Then outrigger motor sticks were tried with success, but they spoiled the appearance of the model. Finally, two sets of motors were tried with each prop in the manner shown on the drawings, with equal success. If you do not care to make the balsa gears, the Hovespian movements may be used. Metal gears were tried and it was found that they weighed the tail of the model down too much to add proportional weight to the nose. The balsa gears are light, easy to make and fit in well with model building methods, because the shafts are cemented to the gears in the same manner a propeller is attached.

## Fuselage

Make two sides of the fuselage right on the drawing. Use 1/16" sq. except where 1/16" sheet is shown. To get the curve at the front, seen on the top view of the sides, pinch the wood with finger nails at 1/16" intervals until the curve of the sides matches the curve of the drawing. Assemble the sides with the

How You Can Build and Fly a Model of the Most Unique Transport-Bomber Ever to Take the Air

By ALAN D. BOOTON and RALPH PICKARD



The model is stable in flight

spacers between. Cover the front with soft 1/16" sheet after the "A" and "B" formers have been cemented in, and cut out for the lower windows and the front plug openings on the leading edge.

Make the two tail booms right on the drawing to insure true shape. The longerons and spacers are 1/32" x 3/16", stripped out of 2" sheet. The 1/32" formers and small tail block are cemented on while on the drawing.

## Cowlings

Carve the cowlings out of medium balsa to the thickness shown to get the proper balance. Add the 1/8" discs and noseplug to each. Sand the outside of the cowlings between coats of dope. Cut out a portion of each cowl, one to fit the left side and one to the right. Be sure to keep the top and sides correct, relative to the cen-

ter lines of the prop shafts.

## Propellers

Cut both blocks to the same shape blank, but carve one to turn left and one to turn right. It is possible to use two right hand props, but a left and a right are more efficient. Note that the spinners are carved integral with the props. Cement 1/16" tubing in the noseplugs, insert the prop shafts through plugs and props with several washers between, and bend winding loops in the shafts before cementing.

## Tail Surfaces

The tail surfaces are cut out of 1/32" sheet balsa. Make a whole stabilizer from the half pattern, and two rudders. Cement the rudders to the stabilizer as shown on the drawing. Now make the "extra stabilizer surface." The model will fly without it, but better glides and performance result from its use, and then it may be removed to return the model to scale. The "extra" has the 1/32" x 1/4" prongs cemented to the top and bottom to hold it to the stabilizer without cementing to the stabilizer.

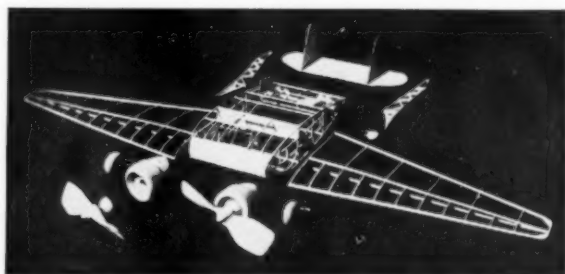
## Landing Gear

Note that the front "struts are really 1/32" sq. rubber and the top wire fitting is bent to extend to the front to prevent the gear from folding forward, but permits it to spring backward when struck. Follow the drawing and you will be pleased with the results.

## Movement Units

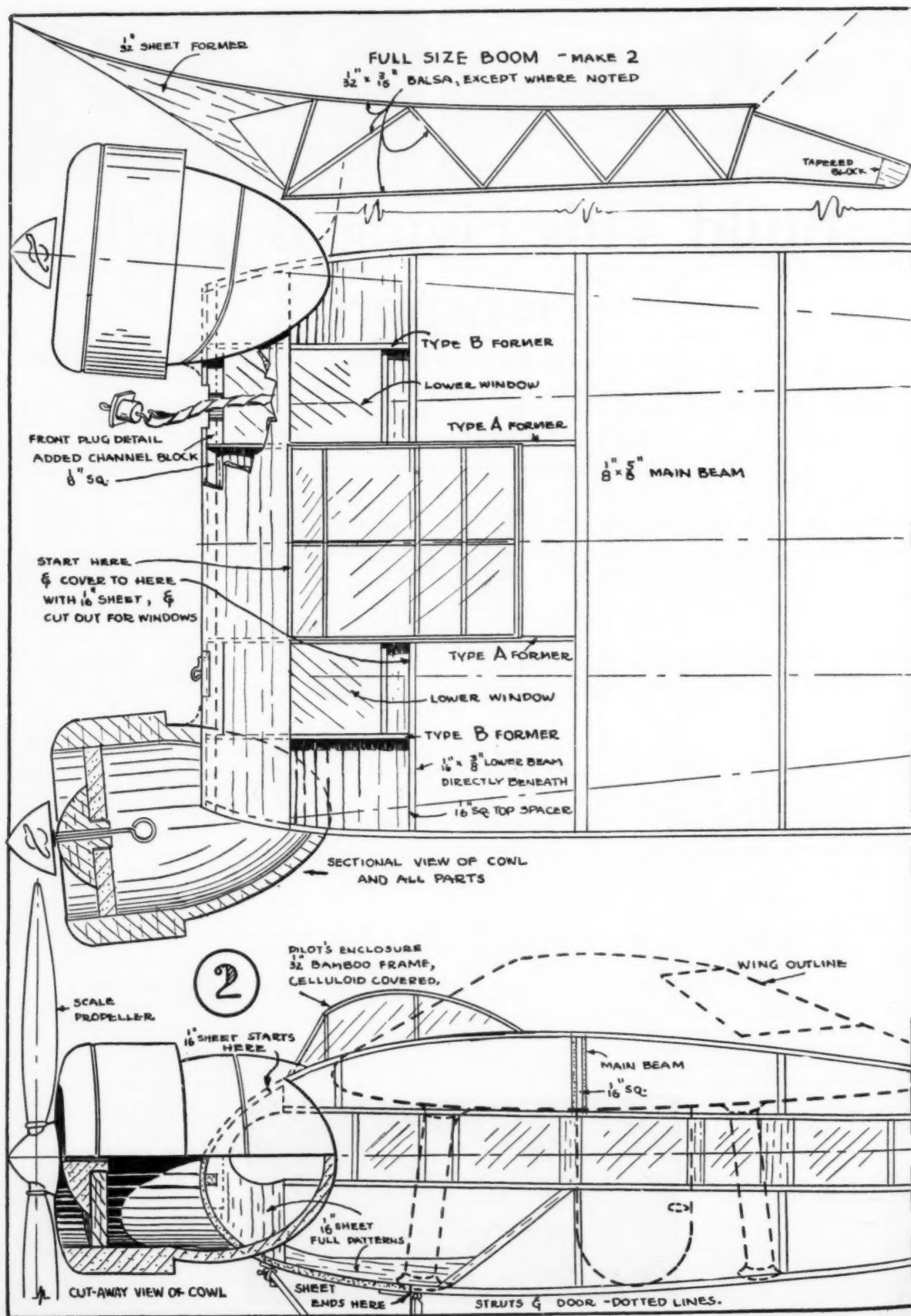
To get matched gears, it is best to make a sheet aluminum pattern. Bend a pin U-shaped at the point and cut the head off. Cement 3 1/32" x 2" sq. sheets of hard balsa together with the grain of each crossing the other. This plywood should dry several hours before attempting to use it. Scribe 1/2" circles on the surface of the plywood with a compass, then cut and sand carefully to the line. Nine discs are obtainable from the 2" sq. sheet, enough to have several to practice on. Now place the aluminum gear pattern on a disc and insert the bent pin, straight end first, in the center holes of both and pull through until the point reaches the pattern. Force the point

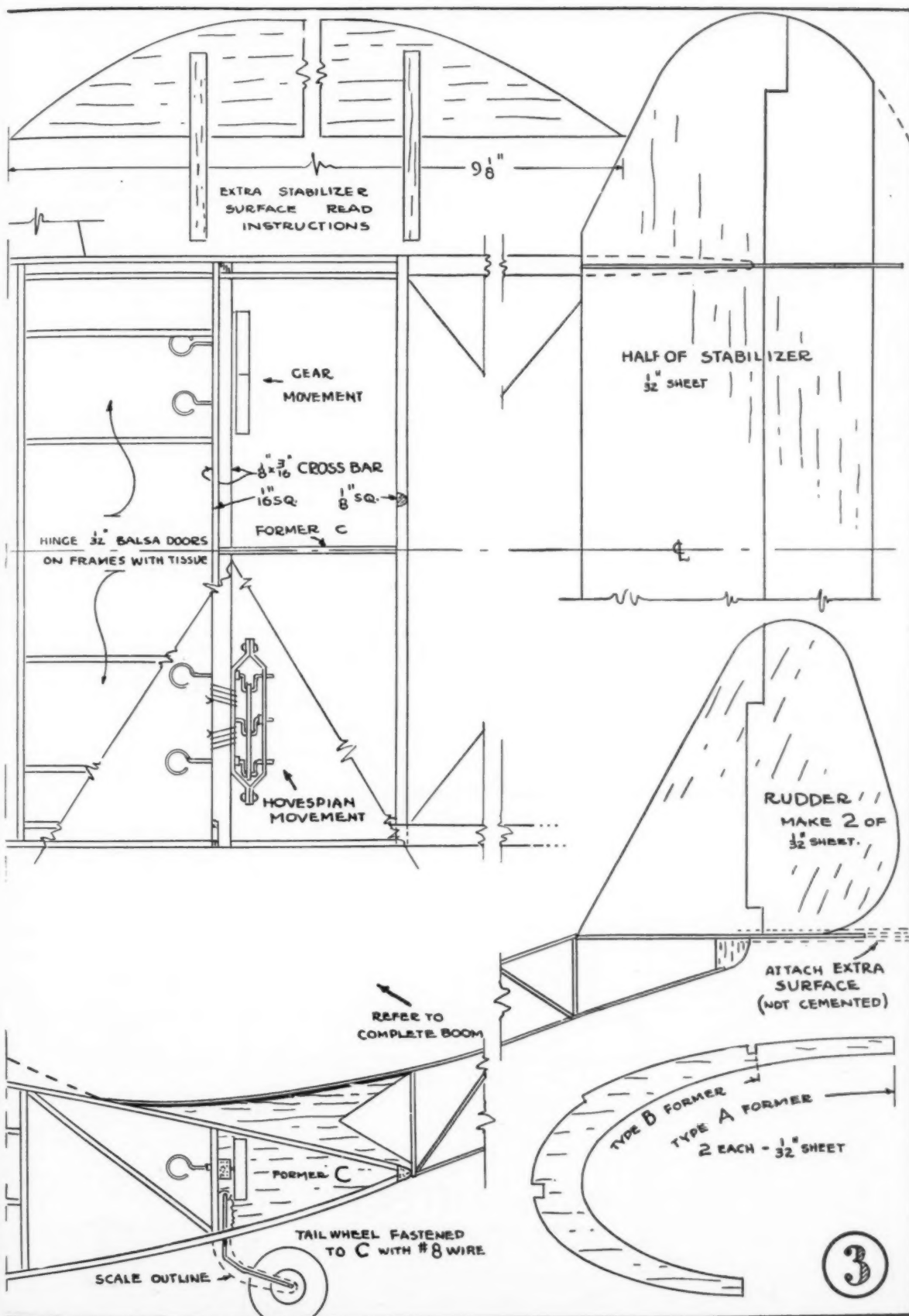
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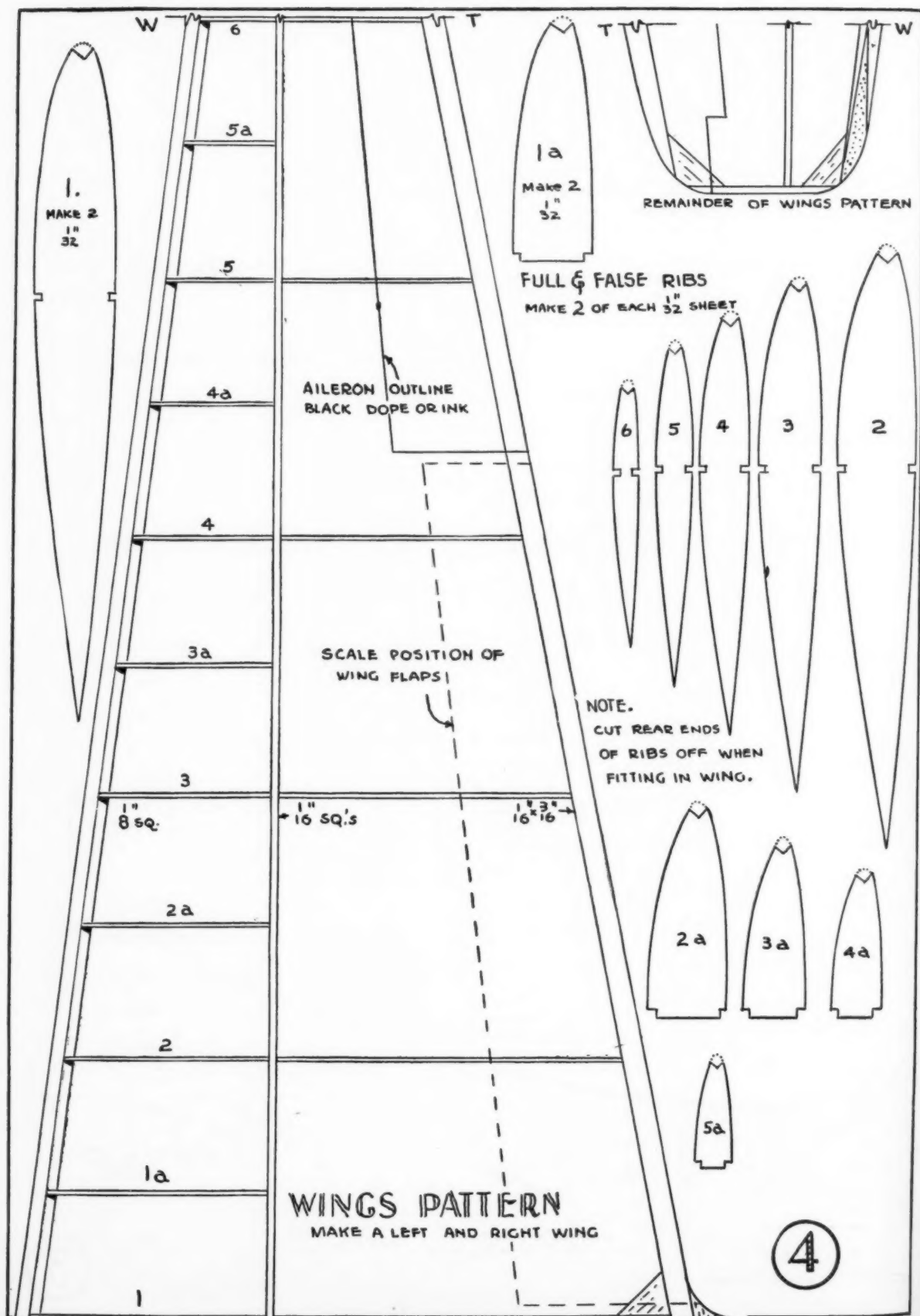


How the uncovered finished frame parts look before their final assembly. Note the light construction.











# Your Duration Model Power Plant

Chapter No. 5

How You Can Design Efficient Propellers  
and Determine the Proper Size of Rubber  
Motors for Your Contest Models

Article No. 65

MANY model builders can carry through the design of a plane in a manner which is efficient and accurate only up to the point of determining the correct propeller to use for their "ship." This is due often to the fact that they think of the wing, tail, propeller and other aerodynamic parts of a model plane as separate and distinct units whose efficiency depends on the individual and separate efficiency of each part. This philosophy will not lead the builder astray, as a rule, while designing the wing, the tail or body of the airplane. In the case of the tail planes, the average builder can invariably make a fair guess as to their size and proportion relative to the wing.

However, when it comes to the point of designing the propeller this philosophy of designing it as an individual and unrelated part of the airplane falls down miserably, for the design of any airplane propeller is entirely dependent upon the character of the ship it is driving through the air. A propeller that may function with high efficiency on one model may be very inefficient on another one.

Therefore it is impossible to set any fixed definite values for the propeller diameter, pitch or area which may be used on every plane. These separate values should be proportional to certain individual flight characteristics of the airplane on which the propeller is functioning.

Not only is this true but the value of any one of the three propeller factors diameter, pitch and area, depend upon the value of the other two factors and to the relative characteristics of the airplane, such as its drag and speed.

We can see, therefore, that the problem is not an easy one but very confusing to say the least because of the complicated relationships involved.

However, an efficient propeller may be worked out without too much trouble if one knows where to start and takes up the determination of the values of the propeller diameter, pitch and area, one at a time.

The characteristic of a propeller which should be determined first of all is the diameter. This is not directly influenced by the speed or drag of the plane, but by the size, which is a structural characteristic and easy to visualize.

Thus there is some basis for starting the design of the propeller of your duration model which has been discussed and outlined in the articles by the author appearing in the June and July issues of MODEL AIR-

By CHARLES HAMPSON GRANT

## PLANE NEWS.

The general rule for the value of the propeller diameter is, make it equal to one-third to one-half the wing span. The span of your duration model being discussed here is 46 inches. Thus the diameter of the propeller to be used should be from 15½ inches to 23 inches.

Now let us consider the factors which will influence your choice of diameter value. First, if the diameter is large, the propeller can be made to turn more slowly than if it is small, the propeller tip speed being the same in all cases. This means a longer propeller run or that more rubber can be used and therefore more power may be transmitted by the propeller with any given blade angle. This is advantageous up to a certain point only, for if too much power is delivered the model may climb out of sight quickly. On the other hand a large diameter propeller makes it possible to have a smaller blade angle with any given propeller pitch (travel forward in one revolution.) This will provide the model with excellent climbing qualities, but causes the

propeller to turn faster than if its pitch should be made larger. Then again more work may be stored in the large motor which is required to drive a high pitch propeller.

## Propeller Diameter

Whereas a large diameter propeller is advisable for the transmission of power and excellent flight qualities under power, a small diameter prop is advisable when the model is gliding, and in cases where the torque of the propeller relative to the wing span should be fairly small.

It appears from this that a middle course should be followed or that the diameter should be small if a small propeller can be designed to transmit the amount of power necessary for a rapid climb.

If the pitch is not too small a great deal of power may be applied to a fairly small diameter propeller and yet have it operate efficiently. Therefore in order to insure little propeller resistance on the glide a fairly small diameter propeller will be chosen for the duration model.

If it is to qualify for the Wakefield Competition, the plane should weigh 8 ounces complete, but only 6 ounces if it is to fulfill the Moffett Contest requirements. The

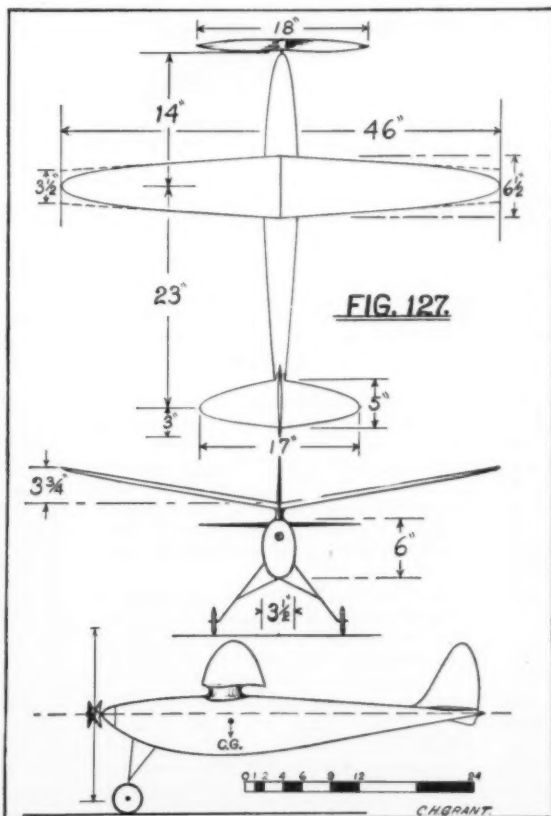
same model may be used with two sizes of propellers and motors, so that when equipped with the large power plant the model will weigh 8 ounces but only 6 or slightly more than 6 ounces when the smaller power unit is used.

A propeller with a diameter equal to about 38% of the wing span will be large enough to produce a rapid climb yet small enough to keep down the resistance when soaring, to a minimum. As the span is 46 inches the diameter should be 18 inches to fulfill this requirement. The diameter of the propeller of the smaller power unit may be 16 inches and yet be more than the specified minimum diameter of one-third the wing span or 15½ inches.

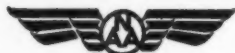
## Propeller Pitch

The next consideration is the pitch that should be given to the propeller. As explained in previous pages, a large proportion of the weight of the model should be in the motor. A propeller of fairly large pitch will turn for a longer period of time than a low pitched propeller and will require more power to drive it in order to produce any given rate of climb. Just because the pitch is high it does not follow that the rate of climb will be

(Continued on page 55)



# National Aeronautic Association Junior Membership News



Prepared by National Aeronautic Association, Dupont Circle, Washington, D. C.

"Largest Entry List Ever" Predicted for 1937 Nationals


THE flood of inquiries in the 1937 National Model Meet being received at NAA headquarters as this issue of MODEL AIRPLANE NEWS goes to press, indicates that this year's entry list should top all previous national contests. The announcement that the gas model events originally scheduled for the Eastern States Gas Model Contest would be run at the National Meet has raised nation-wide interest in the gas model division of the National Contest to a new all-time high.

Richard C. Dupont, President of the Soaring Society of America, is offering a valuable three leg trophy for these events. In addition there will be three small trophies, exact reproductions of the large one, in gold, silver and bronze, which will be retained by the first three winners. The Soaring Society of America, through President Dupont, is also offering \$300.00 in cash prizes to be awarded the participants according to a point system.

Change of dates for the Nationals from the week prior to the 4th of July to July 8th, 9th, 10th and 11th, was made necessary when it became evident that conflict with National Conventions of the Shrine and the National Education Association at Detroit would seriously hamper meet arrangements.

July 7th was set aside as registration day and tentative plans called for holding the banquet for the award of the trophies on the evening of July 12th. A schedule of entertainment and sight-seeing trips to places of interest in and around Detroit was arranged for the morning and afternoon of July 12th.

Berry Brothers, Aviation Division, headed by the well-known sportsman pilot Tom Colby, are general sponsors of this year's contest, which is being conducted under the auspices of the Detroit NAA chapter. Well-equipped headquarters have been established at the Hotel Fort Shelby which will also be the site of a National Model Aircraft Show. Model supply houses, gas engine constructors and other organizations have been invited to participate in this show, which has been planned as a model aircraft show parallel to the

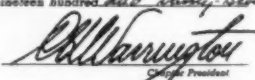
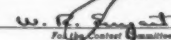
The  
*Aero Club of Washington*  
Chapter of  
  
THE NATIONAL AERONAUTIC ASSOCIATION

Certificate of Merit  
This certifies that:

FRANK R. JOHNSON

established a new city-wide record of 1 minute, 30.6  
seconds for Class C Outdoor Cabin Fuselage, R. O. G.,  
Model Airplanes on October 17, 1937.

Done at *Washington, D.C.* on the *first*  
day of *November*, nineteen hundred and *thirty-seven*.

  
Chapter President  
  
Contest Committee

This is a reproduction of the new Certificate of Merit which NAA Junior (Model) Chapters will use in recognizing city-wide and state-wide flights. This document will bear the name of the individual Chapter and will record the place and date of the flight. It is to be signed by the Chapter President and a representative for the Contest Committee. Elsewhere in these columns you are told who is eligible for NAA Junior memberships as well as given explicit suggestions for forming a Chapter

Annual National Aircraft Show of the Aeronautical Chamber of Commerce of America.

Irwin S. Polk, selected by the sponsors to act as manager of the Meet, has been in Detroit since the 1st of July. Supervision of the technical conduct of the Contest is under the direction of H. M. Jellison of Akron.

The outdoor events will be held, as originally planned, at Wayne County Airport, considered by model flyers one of the most ideal sites in the country for model flying.

## Nine New Chapters Approved by NAA

So keen is the ever-growing interest in model activity throughout the country that

formation of new NAA Junior (Model) Chapters is becoming almost a daily affair. Just recently NAA approval has been given nine new chapters. These chapters are:

Teche Chapter, New Iberia, La.  
Syracuse Chapter, Syracuse, N.Y.

Chanute Chapter, Peoria, Ill.  
NAA Cadets, Los Angeles, Calif.

Mattoon (Illinois) Chapter, Mattoon, Ill.

Milwaukee (Wisconsin) Chapter, Milwaukee, Wis.

Ashland (Kentucky) Chapter, Ashland, Ky.

Bloomington (Illinois) Chapter, Bloomington, Ill.

Mile-Hi Aero Club, Denver, Colo.

What is the situation in your town? Have you taken steps yet toward organizing a unit? If not, then we urge you join the "Big Parade" without delay. Suggestions have already appeared in these columns and further desired information can be obtained by writing to the National Aeronautic Association, Dupont Circle, Washington, D.C.

## Six Big Contests Run Off in June

A full half-dozen important model meets were held in as many states during the month of June. The events were as follows:

June 5th—Fifth Annual State Model Airplane Contest, Field House, Michigan State College, Lansing, Michigan. (Col. Floyd E. Evans, NAA Contest Director.)

June 5th—Connecticut Model Airplane Meet, Rentschler Field, Hartford, Connecticut. (Frank W. Schade, NAA Contest Director.)

June 5th and 6th—Twin City (Minneapolis-St. Paul) Gas Model Meet. (Francis W. Chaffee, NAA Contest Director.)

June 6th—New York State Exchange Clubs Model Contest, Utica Airport, Utica, New York. (Harry C. Copeland, NAA Contest Director.)

June 6th—Midwestern States Meet, Machesney Airport, Rockford, Illinois. (Dr. F. H. Spickerman, NAA Contest Director.)

June 13th—Cincinnati Albatross Birdmen Gas Model Contest, Lunken Field, Cincinnati, Ohio. (Carl H. Hagemann, NAA Contest Director.)


At this point, it may be well to make an explanation to our readers. You will notice that we speak of these events in the past tense, as having already happened. What we want to make clear is that in the publishing of all magazines "copy" must be prepared some time ahead of publication date. Thus the sheer mechanics of the business prevent us from giving results of the meets at this time. But watch these columns in the next issue of *MODEL AIRPLANE NEWS*, where all national records will be reported fully.

### Glider Builder Tells How Model Broke Mark

A new national record for a model glider flight was set recently at Jersey City, N.J., by Paul Chorbojian. Following is Chorbojian's own account of the record-breaking flight:

"My glider was adjusted for a right-hand launch. It was adjusted so as to climb straight up until energy from the launch was expended. It would then recover from a half-roll. The turn was a flat, tight, left turn.

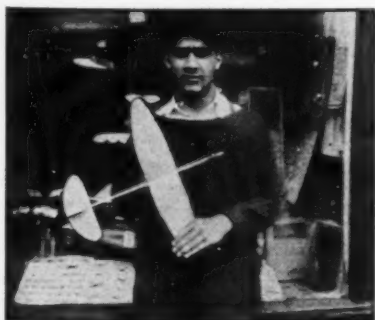
"On its record-breaking flight the launch was only about 60 feet high. However, the recovery was perfect. It immediately hit a current and circled in it but did not gain much altitude. Then it hit another current and rose immediately and kept climbing until it disappeared after five minutes and 30 seconds. The timer added the usual 10 seconds for an o.o.s. flight. As no facilities were available, no effort was made to chase the model."

 We invite "personal experience" stories of this type. Send in an account of your record-breaking flight!

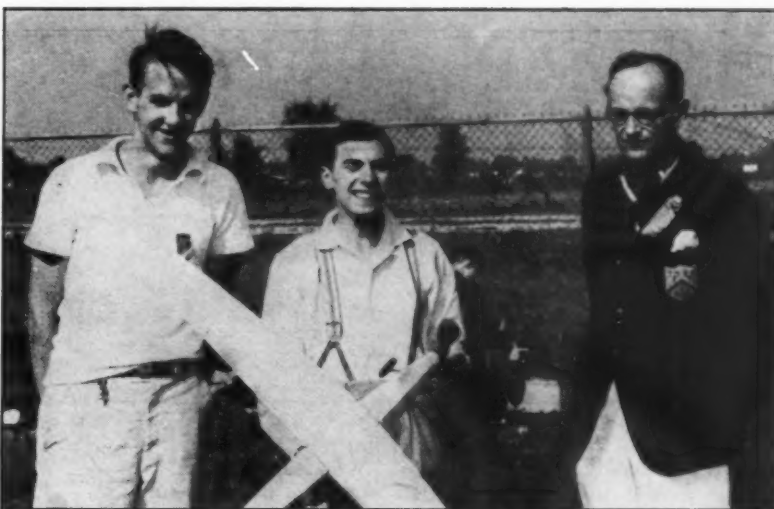
### Exhibition Shows Historical Models

The Stix, Baer and Fuller Model Airplane Club of St. Louis recently held its Fourth Annual Exhibition Scale Model Building contest for solid wood model replicas of historically famous aircraft.

The program, entries for which closed May 23rd, called for separate junior and senior events with engraved silver loving cups as prizes. At the close of the event the models were placed on display at the



Paul Chorbojian with his glider that broke the world's record



A notable group. L. to R.: Gordon Light, 1935 Wakefield winner; A. A. Judge, 1936 winner and J. B. Allman, one of the leading British modelers, enjoying the show at the 1936 Nationals

club's headquarters at Stix, Baer and Fuller.

### 18 New Class A Model Licenses are Issued

The NAA Contest Board has issued up to date 18 of the new Class A Model Licenses which may be won by qualified flights of two minutes indoors or one minute outdoors. Of this first group the city of Chicago holds a virtual monopoly on the recipients. Seventeen out of 18 went to residents of the Windy City, and all 18 were members of the Chicago Aeronauts.


Those receiving the first lot of licenses, together with the duration and type flight, are listed in order below. With the one exception noted, the address of the holders is Chicago:

1. Charles Belsky, 12 minutes, indoor.
2. Wallace Semmers, New Lenox, Ill., 22 minutes, outdoor.
3. Edmund B. Swort, 11 minutes, indoor.
4. Milton Juguelet, 8 minutes, indoor.
5. John Kubilis, 6 minutes, outdoor.
6. Robett Kelbard, 7 minutes, indoor.
7. Marvin Setske, 11 minutes, indoor.
8. Richard Obarski, 12 minutes, indoor.
9. Stephen Myers, 8 minutes, indoor.
10. Leonard Elgenson, 2 minutes, indoor.
11. Seymour Goldstein, 3 minutes, outdoor.
12. William Hollis, 8 minutes, indoor.
13. Richard J. Worel, 2 minutes, outdoor.
14. Dennis Turner, 9 minutes, indoor.
15. Alex Nekinken, 5 minutes, outdoor.
16. Edward Lidgard, 6 minutes, outdoor.
17. Chester Poppa, 7 minutes, indoor.
18. Sidney Axelrod, 19 minutes, indoor.

### Young China Learns Methods of Aviation

Chinese youngsters are now learning about aviation and other scientific mechanical advancements as they play. The government is putting mechanical toys into its school rooms.

This is one of the methods Dictator Chiang Kai-Shek is employing to bring modern civilization to his people. His plans call for more airplanes, automobiles and machinery.

 He has been hampered by the woe-ful ignorance of China's youth about the latest devices. But through such things as toys great strides have been made.

And aviation is sprouting larger and larger wings in that vast, densely-populated empire. China brought in Americans to found a plane factory and to train engineers. That was seven years ago. Now the Americans' work is completed and many of China's planes have been made from start to finish by Chinese.

### 'Chute Jumping becomes Soviet National Pastime

It seems that all Russia is literally up in the air these days. Back in 1933 parachute jumping became a national sport with the Soviets by government order and it is estimated that there are now 20,000 licensed jumpers and a half-million amateurs.

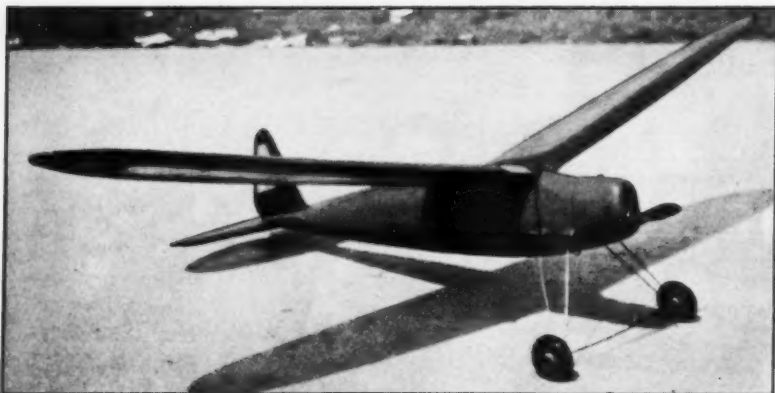
The practicing jumpers now go up in their 'chutes as well as down. Formerly they leaped from towers but now huge fans under gratings in the earth send them plummeting skyward.

Old and young alike enjoy the pastime and women have kept pace with the men. One woman jumped from 25,000 feet. A 75-year-old farmer made a jump and said he "felt like a wild goose" doing it.

The sport has even entered medical schools. Doctors are trained in the art so they can be landed quickly to aid the sick in isolated areas.

Aerial "life-savers" are playing a more and more prominent part in Russia's military maneuvers. In a mock battle a whole army, with full equipment including machine-guns, was landed behind "enemy" lines. Soviet engineers are working on a plan to eliminate the swing of a floating 'chute by trying to regulate the size of the aperture in the 'chute's top.





Frank Tlush's gas model which won first place at the 1936 National Contest held at Wayne County Airport, near Detroit

### Report on Loening Trophy

From Earl M. Bennetsen, of the University of Minnesota, Vice-President of the National Intercollegiate Flying Club, comes a report on the points awarded each college for the Loening Trophy Award under regulations formulated by the NIFC.

Harvard was winner of the Trophy with 85 points awarded on the following basis: flying hours, 40 points; blind, night and radio, 5 points; authorized meets, 10 points; club activities, 5 points; and National Meet participation, 25 points. Leland Stanford amassed 50.7 points, Minnesota, 47.2; and Purdue, 17.9.

### Let's Have YOUR Story!

The NAA believes that in addition to the regular news of meets, records, new chapters and the like appearing in these columns, there is a slightly different type of news which should be immensely interesting to every one of the thousands of readers of these pages. We mean what newspapers call "human interest" stories—such stories as how *you* or one of your friends broke a certain record, came to build a certain type of model, or how some unique device was developed. Send us your accounts of anything of this nature! We believe the field for these human interest accounts is almost unlimited. Let us know what's happening in *your* town or city! Every member of the far-flung fraternity of Model Builders and Flyers is interested in hearing some unique slant on flying or building. Address your communications to the National Aeronautic Association, Dupont Circle, Washington, D.C.

Here is just a sample:

Out in Kansas City, 18-year-old Dudley Grimm has performed before capacity crowds in the Municipal Auditorium with his big gasoline-powered model that has a wing span of seven and one-half feet and a length of 54 inches. He has worked every night for six months preparing for the National Meet at Detroit where he hopes to capture a prize.

Paul Chorbojian's account of his record-breaking flight, given elsewhere in these columns, is another example. Let's hear from *you*!

### Who is Eligible and How to Form Junior Chapters

To clear up any possible misunderstanding concerning eligibility of Junior members and the way to organize a Junior Chapter, we give you the following information:

Any person of upright character under the age of 21 and interested in the science or art of aeronautics is eligible for a Junior membership in the National Aeronautic Association.

And here are the suggested steps in making application for a Junior Chapter of NAA:

1. Call an "organization" meeting of the leading model builders in your community or if you are already organized as a Club, have the Club Officers call such a meeting.

2. Get whomever you have in mind to serve as Senior or Club Adviser to attend the meeting. If possible, discuss your plans with him prior to the meeting. If you can get him to take the initiative in calling the meeting, this is very desirable.

3. Select a chairman for the meeting by popular vote (usually the individual who calls the meeting is the best selection) or, if you are already organized as a Club, the Club President should preside.

4. Present the proposal that all those present serve as an "organization" committee for the purpose of seeking affiliation with the National Aeronautic Association as a Junior or Model Builders Chapter of that Association.

5. Explain the patriotic, non-commercial, non-profit nature of the NAA, what it does in fields other than model building—in College Flying, Gliding and Soaring—how it certifies such records as Howard Hughes' transcontinental dash and supervises such annual events as the famous National Air Races.

6. Then explain the Purpose, Requirements, and Benefits of NAA Junior (Model Builders) Chapters.

7. Go over each of these items carefully and in detail. Be sure each person present understands just what the NAA stands for and its purpose, what the requirements are, just what individual and Chapter "benefits" will be received.

8. Get at least ten of those present, who are eligible to be Junior NAA Members, to sign the Charter application.

9. Get the person you have asked to be your Senior Adviser to sign the application, also (and, in addition, to make application for appointment as an NAA Contest Director for Model Aircraft, if he is qualified).

10. Collect the necessary membership dues and forward the Charter application, together with the correct amount of dues, to the National Aeronautic Association, Dupont Circle, Washington, D.C.

11. If there is a Senior NAA Chapter in your town endeavor to contact the President or Secretary for an endorsement of your charter application. Such endorsement not only will strengthen your application, but may help to get desirable sponsorship for your club from the Senior NAA organization.

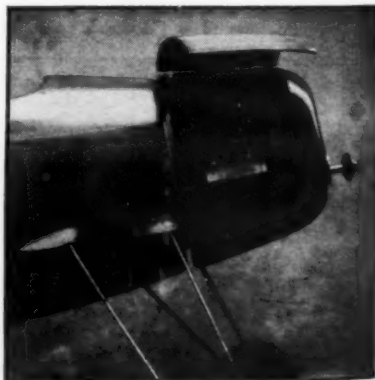


12. If no Senior NAA Chapter exists, you may wish to solicit the endorsement and help of other local civic or commercial clubs or school leaders interested in boys' work. Such endorsement will give your application increased weight.

13. If the application is accepted by the NAA an official charter for a Junior Chapter, with the names of the charter members inscribed thereon, will be prepared at NAA Headquarters by the NAA, signed by NAA Officials and forwarded to the new Chapter which may then proceed with its official existence.

14. In addition to this charter, the new Chapter will promptly receive the following:

- (1) Chapter Manual, containing chapters on Club meetings, trips, ceremonies, contests, proficiency ratings, study courses and a chronology of the leading books on model building.
- (2) Suggested by-laws, indicating affiliation, their terms of duty and duties.
- (3) An NAA junior membership card and annual sporting license for each member listed on the charter and a handsome NAA lapel pin for each such member.
- (4) Three copies of the current issue of "The NAA Eagle," containing national model news of interest.
- (5) One copy of the official national model rules.
- (6) A model meet sanction application form and a summary of the contents



On Frank Tlush's model the cowl can be raised to give access to the motor



of the meet "kit" furnished meet organizers when sanction is granted.

15. Services which the Chapter would obtain during the year would include the following:

- (1) The monthly "NAA Eagle," containing news of new records, the National Contest and other important sanctioned meets.
- (2) Listing of official national model records (distributed quarterly).
- (3) One copy of the monthly "National Aeronautic Magazine" (sent to the Senior or Club Adviser) as a regular member of the National Aeronautic Association.

16. Services which would be available to the Chapter on request in writing would include:

- (1) "A" Licenses for members of the Chapter who were individual members of the NAA and who, in officially timed flights, had successfully completed the performance requirements for this license.
- (2) Sanction of meets organized or sponsored by the Chapter, with each sanction including a meet "kit."
- (3) Recognition of any national records established by individual NAA members of the Chapter with an engraved record certificate going to the record holder in testimony of his record performance.
- (4) Recognition of any official regional or state-wide records set by individual NAA members of the Chapter if it is decided by the NAA during the year to recognize a limited number of such records.

#### Four Records Established Under New Weight Rules

Two records have been established for hand-launched stick models, one for fuselage R.O.G. models, and a fourth for gasoline powered models under the new weight rules. All of the marks were set at Indianapolis.

Donald Lodge made a flight of 42 minutes and 47 seconds with a gasoline-powered model, on May 23rd, using one-eighth ounce of fuel for each pound of model weight according to the new regulations.

A Senior Class C hand-launched model flight of one minute, 21.5 seconds was recorded by Harold Harris, 17 years old, at the Indianapolis Model Airplane Club outdoor contest held on April 25th.

At the same meet Jim Cahill, 19 years old, kept a fuselage R.O.G. model aloft one minute, 11 seconds in the Senior Class C division, and John Foster, 17 years old, in the Senior Class C group, was timed for 30.5 seconds with a hand-launched stick model.

The new regulations for these types of models are for three ounces of weight per 100 square inches of wing area.

A recent enviable record for gliders, unaffected by the weight regulation changes, was established when Paul Chorbojian sent up his hand-launched craft for a flight of five minutes and 40 seconds at the First Outdoor Contest of the Hudson County Chapter of NAA at Jersey City, N. J., on May 2nd.



Members of the Chicago Aeronauts Club of Gage Park, 2411 West 55th St., Chicago, Ill.

Three records were set at the Philadelphia Model Airplane Association Indoor Championship meet in the Quaker City on May 1st. The new holders and their records are:

Walter Lees, 18 years old, 14 minutes and 35.4 seconds with a stick model R.O.W. in Senior Class B.

William Hawks, 15 years old, 11 minutes and 8 seconds with a stick model R.O.G. in Class A Junior division.

David Call, 15 years old, 10 minutes, 41.2 seconds with a stick model R.O.W. in Junior Class B.

#### Six Contest Directors Appointed by NAA

The National Aeronautic Association announces the recent appointment of six new Contest Directors. The new appointees are as follows:

Carl H. Hagemann, 818 Wade Street, Cincinnati, Ohio.

Gunnar Munnick, 101 Alstead Street, Quincy, Mass.

Merrill W. Fox, 3114—5th Ave., Huntington, W. Va.

Frank C. Paiva, Fresno, California.

Louis Cordaneo, Bayonne, N.J.

Rocco Glorioso, New Iberia, La.

#### Army Launches Air Defense Program with West Coast Base

Establishment of a \$7,000,000 Pacific Air Base at Sacramento, California, is the initial step in the national air defense program of the War Department, according to a copyrighted article in The National Aeronautic Magazine for July. The publication is the official organ of the National Aeronautic Association which has long interested itself in a stronger national air defense.

With work on the huge defense project to start immediately, the supply base will serve the entire West Coast, including Alaska, Hawaii and the Philippines. At all times, at least 12½ per cent of the planes in this Western area will be in the new depot, to be reconditioned, repaired or rebuilt for service. Work on the Sacramento base will precede work on all other air defense bases.

Evacuation of Rockwell Field, San Diego, by the Army in order that the Navy might have the entire use of that depot, made it compulsory for the War Department to establish a new repair base immediately.

Use this coupon for either junior membership application or for requesting NAA Junior Chapter information.

#### NATIONAL AERONAUTIC ASSOCIATION OF U.S.A. Dupont Circle, Washington, D.C.

- ☐ Please send me information on how to form an NAA Junior Chapter and a Chapter charter application form. I enclose a 3c stamp for return postage.  
☐ I enclose fifty cents for annual NAA Junior membership dues (use check or money order) and hereby make application for Junior membership in the National Aeronautic Association.

Name ..... (Please print or type)

Street .....

City ..... State .....

Date of Birth..... (Month, Day, Year)

Membership application approved\*.....

\* (If membership application is being made and applicant is under eighteen, have parent sign here.)

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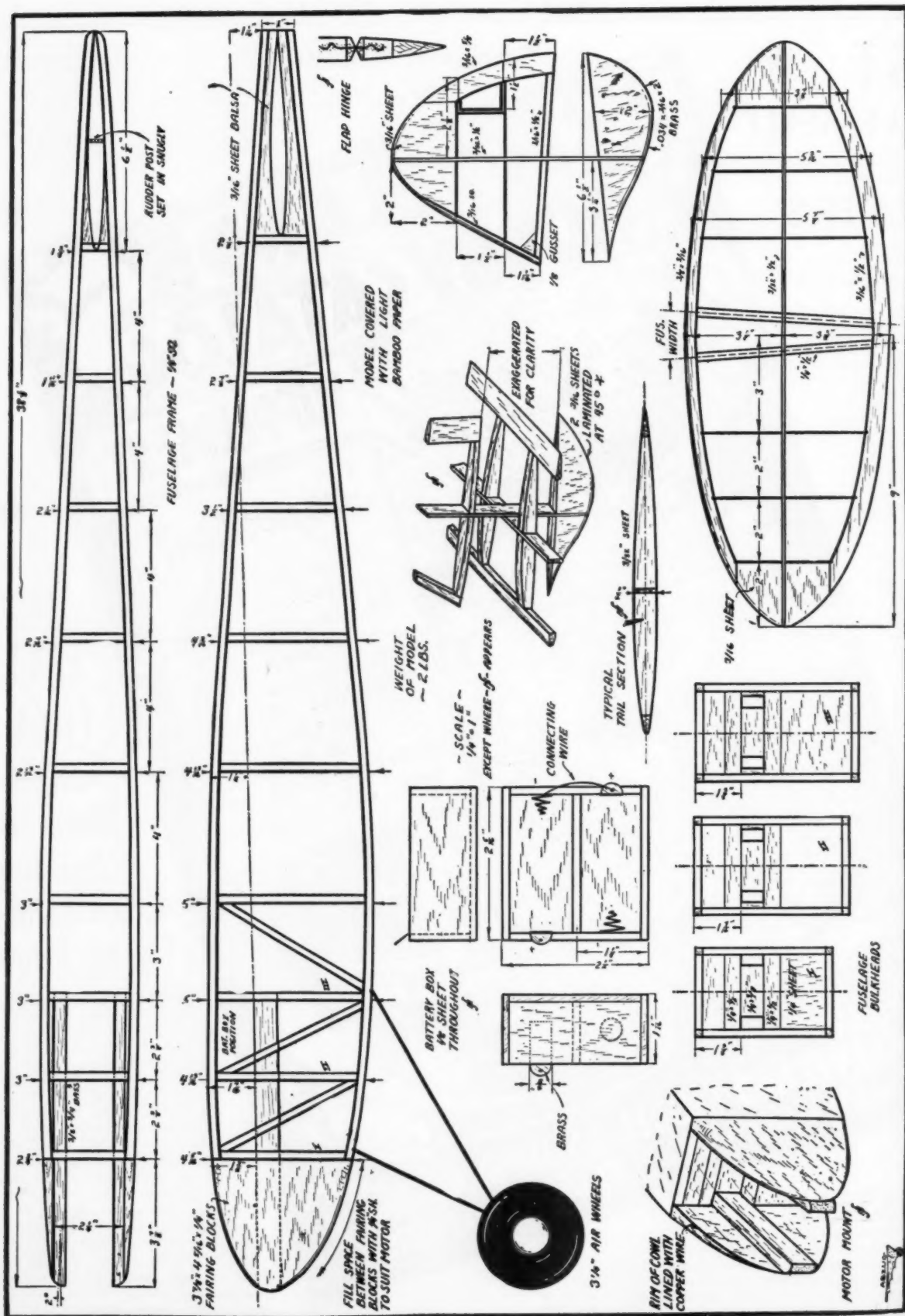
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SCALE MODELS  
at the  
RIGHT PRICES!**

**WORLD'S GREATEST  
HOBBY VALUES!**

**CLEVELAND MODEL & SUPPLY CO., Inc.**  
1866 N W 57th St. CLEVELAND, OHIO U.S.A.

1866 N W. 57th St.,

Cleveland, Ohio, U. S. A.



# The Flying Midget Gas Model

COME to think of it, it has been only a few years since the first gas job leaped, or should we say wheezed in-to the air. But we have come a long way since that moment. The gas job has undergone many interesting transformations and changes. The first type to appear resembled a light plane in construction, weight, and handling ease. We'd rather not talk about these, the sooner they are forgotten, the better. Out of this first attempt, the "box-car" grew. This type of gas job still enjoys the greatest popularity of all among the majority of gas-jobbers. They find that its blunt lines and clumsy appearance do not affect its flying qualities, most contests being won by them. But just as airplane designers are using the monocoque and stressed skin construction more and more, so are many gas job builders turning to the streamlined gas job. A treat to the eye, these gas jobs significantly walked away with the Texaco Event at the last two National Meets—Watch out for them!

An even later development is the very small gas job, sometimes built tiny enough to compete with rubber-powered models. Such a model is our Flying Midget, which boasts of a wing containing only 300 square inches in spite of the fact that it carries 1/5 horsepower in the nose. A development of the first Flying Midget, which flew at the 1936 Nationals, this job has a climb that can be described mildly as spectacular. Add to this a fast, level glide, and you can see why I thought the week spent in building her very wisely squandered! In regard to her handling ease, I can claim at least one record; (metropolitan model-builders please note); as far as I know, the Flying Midget was the first gas job ever to be taken into and out of a moderately crowded subway car as one unit!

## Fuselage

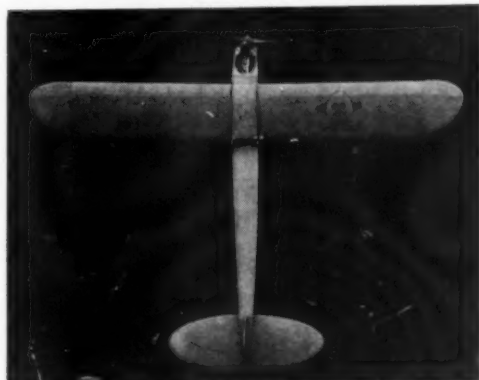
The plans are almost self-explanatory, but some points may need clearing up. When the fuselage frame of 1/4 square hard balsa is completed, the landing gear should be installed. The wire struts are first accurately bent, then bound to 1/4 square strips, which are in turn strongly bound and cemented to the fuselage. The joint of the two landing gear struts near the wheel is firmly wrapped with annealed wire, then soldered, welded or brazed. Air wheels are important; the model always comes in "fast." The next step is to install the motor runners. The bulkheads that hold the runners in place are

Here's a Simple Gas Job With Only 300 Square Inches of Wing Area That Flies Well and Is Easily Transported

By THRACY PETRIDES and MALCOLM ABZUG



The completed plane has clean lines and is well proportioned for stability. The construction is simple



The long fuselage gives it a high degree of longitudinal stability



The model in full flight

## EDITOR'S NOTE

Though the plans specify 6° angle of incidence, the Editor advises only 4°. This will make the tail surfaces more effective and produce greater climb and stability.

built up of 1/4 flat hard balsa around the runners in the indicated widths, until they are solid units resembling the bulkheads in the plans. Make the motor mount strong; it will have to take plenty of punishment. The motor runners are faired into the fuselage with two fairly soft balsa fairing blocks. These blocks are of 1/4 sheet balsa, cut to shape before cementing and are cross-grained on the inside with 1/32 sheet balsa. It is recommended that the 1/4 sheet blocks be slightly hollowed out before the 1/32 sheet is cemented to them. The composite blocks are then glued to the outer sides of the motor runners with the straight end flush against the first bulkhead. On top and bottom, as suggested, fill in the space between the blocks with 1/4 sheet balsa to suit your particular engine.

As a final touch, line the inside rim of the cowl with copper wire to prevent chipping and seaming.

The last bay of the fuselage is filled in with 3/16 sheet balsa in all sides. On top and bottom, these filler sheets are cut across in their exact center to permit the rudder post to pass through. On the sides, however, it is necessary to cut out holes that will permit the stabilizer to be slipped through and cemented. These holes are naturally the air-foil shape of the center stabilizer rib. Before covering the fuselage, make and install the battery box on top of the motor runners and build in the entire wiring circuit. The coil and condenser unit is attached flush against the inside of the first bulkhead, on the floor of the fuselage. Only when all the preceding steps have been completed, can the fuselage be covered.

## Wing

Although the wing seems unnecessarily strong for this small model, remember the disproportionate strains it will undergo during flight. The wing loading of this ship is .96 lbs. per square foot and its power loading is 10.4 square feet per hp. (Over five times that of the world record gas job.) Need we say more? (Apologies to F. Zaic.) The main spar of the wing is built of 1/8 x 3/4 medium stock reinforced at the dihedral joints with 1/32 sheet balsa plate glued on both sides. The 1/32 sheet balsa covering on the leading edge is put on last; its purpose being to prevent the loss of any of the precious little lift. When covering the wing and all the other surfaces for that matter, take special care not to warp them. A warp in the surfaces of a slow flying box-car is bad enough,

(Continued on page 48)





# How to Adjust Outdoor Models

Some Suggestions From an Expert That Will Help You to Win Contests If You Follow Them Carefully

By VERNON BOEHLE

THE building and flying of model airplanes has always been one of the most interesting of sports, but with the passing of each year it becomes even more interesting and more intricate. This is due chiefly to new developments being made, which tends to attract the air-minded boys and girls of the nation to this thrilling sport.

In this article which I am writing, I will endeavor to tell some of the inexperienced model builders who haven't been in this game very long, some of the fine points which must be included in the design of a duration model, to make it a good and consistent flyer.

It isn't a difficult job to design a model that is capable of winning contests. The most important things to bear in mind are stability and gliding characteristics.

Some of the most important developments which give a model the qualities of being a consistent flyer, are the free-wheeling propeller, negative line of thrust, and the off-setting of the propeller to the right, which changes the line of thrust. These three developments in the main are responsible for the great increase in duration records in the past three years.

Free-wheeling propellers came into general use after the National Contest in Dayton in 1931, and at the National Contests in Atlantic City in 1932, practically every model was equipped with it.

In 1933, with the advent of the weight rule in all the contests, model builders the country over started designing new and different models, to attempt to overcome the handicap of the extra weight which they were now compelled to use. At first no doubt, as it seemed to the builders here in Indianapolis, it was a huge handicap to practically double the weight of a model without increasing the area to support the added weight. But as new models were built and flown, and the latest ideas were used in the design of their models, the designers overcame these obstacles. Today the records for weight models are higher than the records of non-weight models were when they were discarded as National Contest models in 1932.

The model I used in the 1933 National Contest in New York, was built on the theory that a tapered wing would support more weight and help the glide, while a large propeller which was nearly one half as

long as the wing, would give the best results. I also decided to use a large stabilizer and approximately two degrees of negative thrust, which arrangement lowers the center of gravity and permits the wing to be moved forward slightly. (See MODEL AIRPLANE NEWS, April 1934 issue, page No. 34, third column, and June 1933, page No. 15. A positive stabilizer creates a positive thrust. Editor.)

The model was adjusted to fly against the torque, which allowed it to have a tighter circle than it would have, if it had flown with the torque. If the model were adjusted to fly with the torque, it would have a straight glide when the power gave out, and this would lessen the chances of staying in a riser when it chanced to glide into one.

After test flying the model I found out that because of the torque, the model would go into a tight spiral dive at the end of the flight with this adjustment, and if the model was adjusted to have a

medium circle after it started free-wheeling, it would have a large circle at the beginning of the flight. (See Fig. No. 1.)

Heretofore on non-weight models, little trouble was experienced with the torque, because they used less rubber and small propellers, and the area of the wing was much greater in proportion, in comparison with weight models.

After studying over the problem for a while, I found that if the propeller were offset to the right slightly, I could still have the rudder adjusted for a medium circle after the model started free-wheeling, and yet have the same circle at the beginning of the flight. (See Fig. No. 2.)

This arrangement worked beautifully and the model became a consistent and reliable flyer.

This it demonstrated when it placed second in the Stout Outdoor Contest in New York in 1933, when Maxwell Bassett won first place in every event with his gas model.

At the American Legion Contest in Indianapolis last summer, the same model was lost to sight at twenty-eight and one-half minutes, but was returned to me three weeks later, being found approximately one quarter mile from the spot where we lost sight of it directly over our heads.

After the National Contest in New York, I began considering the possibilities of using a tractor model in the Mulvihill Contest. Tractor models were not unheard of up to this time for use in this contest, but they had not proved to be very successful.

The disadvantages of a twin pusher to my way of thinking, were very numerous, but the main one is the poor glide after the power is exhausted.

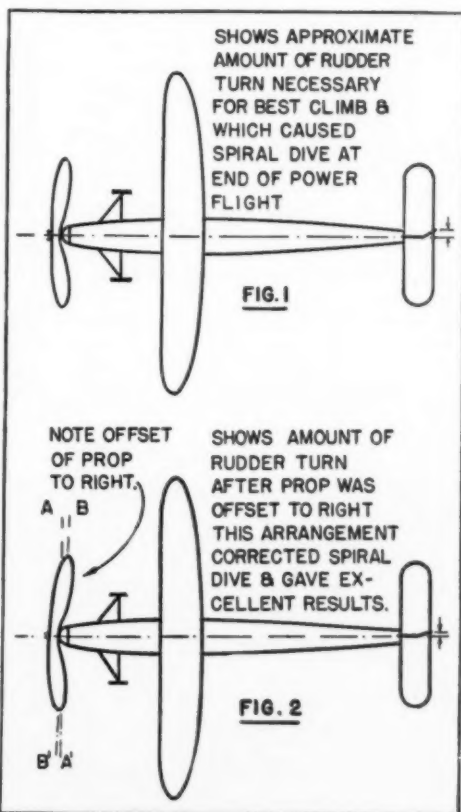
On many occasions I have seen many twin pushers attain high altitudes and apparently seem to be headed for record flights but due to the poor gliding qualities as a result of the drag from the exposed motors and the open A frame, literally drop out of the currents to end what would have been an exceptional flight, but which was merely another flight.

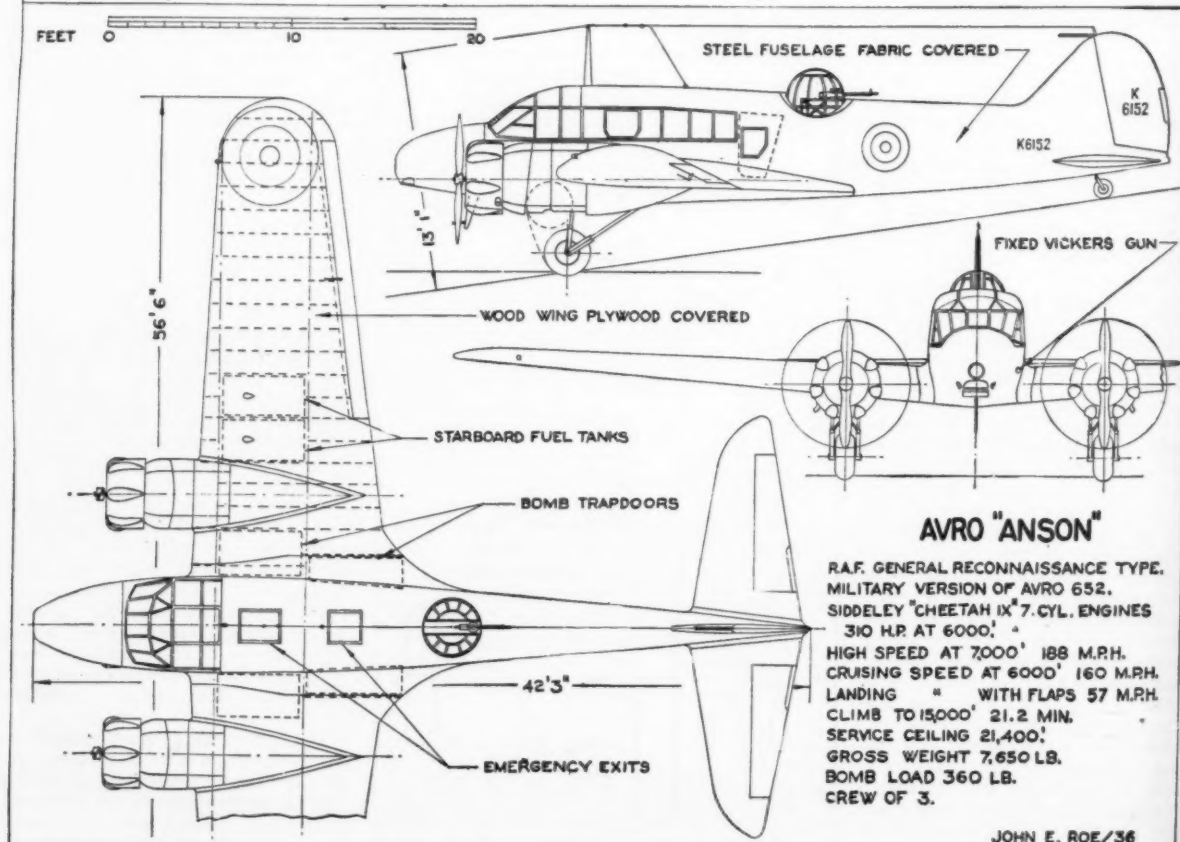
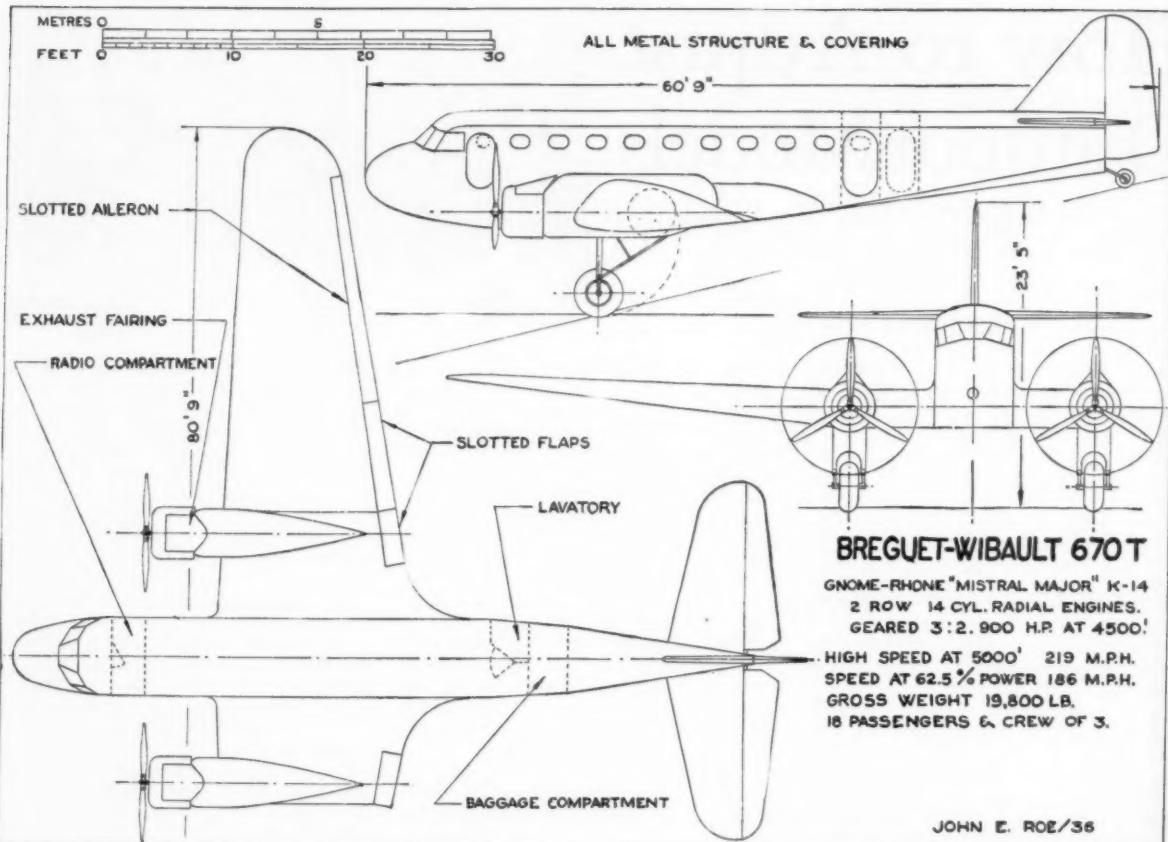
There are ways of streamlining the A frame of a twin pusher, but this involves a great deal of labor, and if the two motors are enclosed in tubes, it makes it difficult to wind

(Continued on page 52)



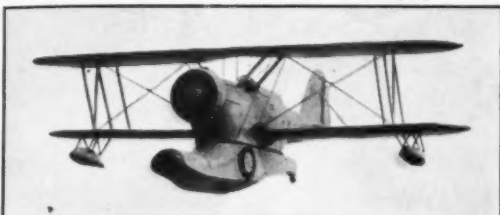
A busy group of champions at the 1936 Nationals



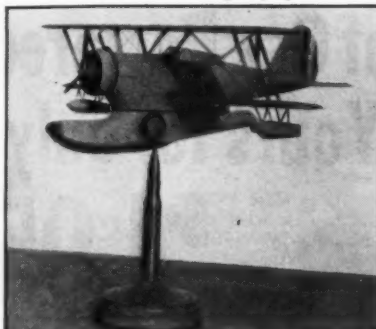




Pict. No. 4. The Findlay Model Club's display of winning models



Pict. No. 1. Not a real ship in flight but only a perfect model Grumman JF-3, by Dave Whitford



Pict. No. 2. Dave Whitford's Grumman JF-3 mounted on a 30 calibre shell



Pict. No. 3. Frank Knorowski and the skeleton of his scale model Stinson



Pict. No. 5. The display of winning models of the W.P.A. Contest in Pittsburgh, Pa.

# AIR WAYS HERE AND THERE

What Readers Are Doing to Increase  
Their Knowledge of Aviation in All  
Parts of the World

## Air Ways Club News

IT IS hoped that the Air Ways Club members will not feel slighted because of the fact that there is only one page of Air Ways this month. If they do, they should feel that it is all in a good cause, for one page was taken from Air Ways to present the editorial on the gas

model plane situation. We hope that every Air Ways Club member will read this editorial carefully inasmuch as many rubber power model builders are interested in gas models or will in the future turn their attention to this most essential contributing factor to their model education.

We urge you to do everything possible to thwart this campaign to scrap all gas models.

Gordon Sear Williams of 5740 36 Avenue N.E., Seattle, Washington, has sent to us a picture of one of the finest scale models ever to grace the Air Ways column. It is shown in picture No. 1. It is hard to believe actually that this is not a Grumman JF-3 Navy amphibian in full flight. Below it, in picture No. 2, you see the same model poised on a thirty caliber shell. It will give you some idea as to the actual size of the model when you know that the shell is about three to three and a quarter inches long. Dave Whitford of Seattle built this model. He is employed at the Boeing Aircraft Company, and is one of the ace model builders of Seattle.

Picture No. 3 shows Frank Knorowski of 24 Engel Street, Glen Lyon, Pa., with his four foot scale Stinson Reliant. He tells us that it took him a year of his spare time to build it. The body is made out of a solid block thinned down to the proper thickness. Many details are carried out. The lights in the cabin are operated by a switch on the instrument board. It is also graced with a dual "Y" control column and upholstered seats. A small electric motor

drives the propeller and gives it a very realistic aspect. The model is equipped with speed-arrest flaps.

Picture No. 4 shows a display of winning models and trophies in the window of the First National Bank of Findlay, Ohio. These belong to members of the Findlay Model Plane Club.

Picture No. 6 was taken when Edward A. Zahn of 29 Salisbury Avenue, Stewart Manor, New York, was not looking. He is Air Ways Club member No. 1071 and is shown busily engaged in the construction of a gas model in his workshop. You will note that the usual possessions appear on the walls. There are not many "shots" taken in which there is not a large propeller of some kind. The one appearing in the background of this photo is from a Nieuport 17. This is truly a treasure. Worn-out, discarded models are also shown along the ceiling, and corners of the workbench. The Zahn "shot" looks comparatively neat in this respect. Edward tells us that the gas job is a Rearwin. One of the features of the shop is a blackboard which he says is an invaluable aid to him when he wishes to make construction notes.

## CLUB NEWS Philadelphia, Pa.

Mr. Victor R. Fritz, field director of the Philadelphia Model Aeroplane Association of 1427 Spruce Street, sends us the following news:

For the past few months, under the encouragement of myself, several boys of the P. M. A. A. have been making experiments

(Continued on page 40)



Pict. No. 6. Edward Zahn brings to life a Rearwin gas job in his workshop



## Air Ways

(Continued from page 39)

with a one bladed propeller for Model Aircraft. This, as you know, is also being carried on in an experimental way in the man carrying field.

Charles Janton, of the Central High School Chapter, and William Hibbert, of the Olney High School Chapter, were the first two boys to fly a model in a regular meet using the one bladed propeller.

During the experiments and actual flights in the contest, many interesting things were learned. As soon as these experiments are completed, the details will be made public.

## Montrose, Pa.

The Montrose Model Airplane Club, of which Winthrop W. Ely is instructor, held their first contest this spring. Though the town has only about 2000 population there are about 50 members in the club. The events and their winners are as follows: Solid Model event was won by Leonard; Miller had the Best Constructed Flying Model Under 28 Inches, as well as the Best Constructed Flying Model Over 28 Inches; Billy Thompson won the Best Taxiing in Straight Run event.

## Boston, Mass.

One of the features of May was the Eighth Annual New England Championship Model Airplane Contest, which, as the Junior Aviation League who sponsors it chooses to call it, "The Little Nationals." An account follows immediately after the list of winners, who are:

The Indoor events winners: Glider by Marchi with a time of :42.2; Stick H.L. by Haynes with 14:22; Fuselage R.O.G. by Capo with 9:38.8; R.O.G. Stick by Tyler with 11:07.2. Winners of the Outdoor events: Gliders by Sampson with 1:27; Stick H.L. by Wallenstein with 4:40 and Fuselage R.O.G. by Barrett with 10:00.

The biggest model plane meet ever staged in New England was held recently when the 8th annual New England Championship Model Airplane Contest sponsored by the Jordan March-Boston Traveler Junior Aviation League drew hundreds of contestants and thousands of spectators.

Added interest was given the two-day battle by the five gas motors which were given as prizes in addition to trophies, cups, plaques, medals and kits. Top honors of trips to the National Contest in Detroit went to Leaguers Torrey Capo, Hewitt Phillips and Wilbur Tyler.

The indoor events were run off in spacious Boston Garden on May 22 from 9 a.m. to 4 p.m. The annual New England Banquet for indoor winners was held in Jordan Marsh Company's banquet hall on Saturday evening, the 22nd.

The outdoor battle was fought at Harvard Practice Field on Sunday afternoon, May 23 from 2 to 6 p.m. in the shadow of historic Harvard Stadium. In fact, the Stadium proved to be a trap for many a model during the afternoon's flying.

Since the outdoor meet was held under the N.A.A.'s new weight rule many new national records were claimed. Almost every Boston record was broken during the two-day fray.

(Continued on page 62)



## All the Thrills of Gas Powered Flight can be Yours for only

# \$1.95

COMPLETE  
Including M & M  
Pneumatic Rubber  
Wheels

POSTPAID  
OR AT YOUR DEALER

As this model has just been introduced, dealers may not yet have stock. If your dealer has no kits, send your order direct.



LOOKS LIKE A GAS MODEL!  
FLIES LIKE A GAS MODEL!!  
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## FLIES 1/2 MILE (2500 Feet)

MOVABLE CONTROL SURFACES ON RUDDER AND ELEVATOR

SHOCK PROOF GAS MODEL TYPE LANDING GEAR WITH PNEUMATIC M & M RUBBER WHEELS

NEW TYPE BALL BEARING PROPELLER WASHER

SPECIAL BROWN CONTEST RUBBER

ADJUSTABLE WING WITH NEW TYPE CLIPS

Also includes a novel feature never attempted in a kit before—this is the "Ratchet," a device that creates a sound resembling the hum of a real gas motor. All material for its construction is included in the kit and it is easily made. This model also has adjustable wing—movable forward or backward to adjust balance. Special clips are built into the under side of the wing to hold rubber strands (which stretch around fuselage) and hold wing in place.

The "Flea" is the next best thing to a genuine gas model! It is just the model for those desiring to gain experience before tackling a real gas model.

It looks like a gas model—it flies like a gas model—it sounds like a gas model—and it costs only \$1.95.

Send 5c for the new SCIENTIFIC Catalog illustrating and describing many models and complete assortments of gas models, parts, supplies and motors. New Catalog just out.

WE have spent months on experimental work to produce a brilliant performing model airplane for you model builders who have always wanted a gas model, but who have been handicapped by the expense involved. Here it is! Now you can make a gas type rubber powered model that will give you all the thrills of building and flying a real gas model—at a fraction of the cost. BOYS! Here is a brand new type of construction that will produce a beautiful and practical result. A ship that looks and sounds exactly like a gas model in the air! A fast climbing, high altitude flyer with remarkable duration. Think of it—your own gas type model that will soar majestically aloft, steady and graceful as an air liner under expert command! You will surely want to build one of these fine ships.



WINGSPAN 36" LENGTH 28"

WEIGHT 4 Oz.

Glide: 20 to 1

Climb 200 Ft. per Min.

### KIT CONTAINS EVERYTHING

required to build this model 100% complete. Completely turned wood cylinder and spark plug made in one piece; all wood parts for constructing crankcase, exhaust pipe, air intake, throttle, etc.; pair of 1 1/2" M & M pneumatic wheels with inflating tube; true pitch 10" machine-cut Balsa wood propeller; all ribs, bulkheads, fairings, and curved parts clearly printed on selected Balsa; strip Balsa carefully cut to accurate sizes; liberal quantities of cement, banana oil, and a bottle of rubber lubricant; brown contest rubber; landing gear wire; washers; tissue; sheet aluminum and brass; motor hooks and all necessary metal for building ratchet motor-hum effect; Balsa balloon tail wheel; correct gauge wire for fork and wing clips, and soft hinge wire for movable surfaces; also a set of the most complete and easily understood plans ever devised, including all information on the construction of the entire model and the dummy gasoline engine. Everything shown in detail and full size. Insignia printed in color on gummed paper ready to attach.

The biggest money's worth you ever saw for only \$1.95!!! Order your kit now!

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# THESE SCIENTIFIC GAS MODELS ARE ALL PRIZE WINNERS!

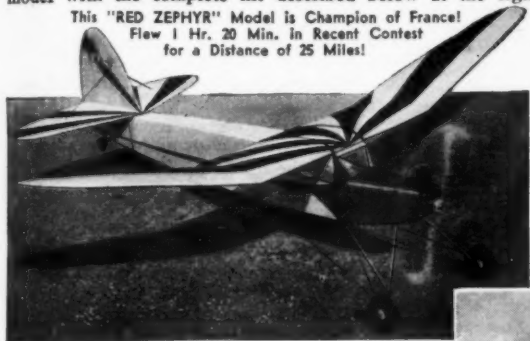
Outstanding Gas Model Achievement of all time—the Model that has come out ahead in every competition in recent years.

## MAXWELL BASSETT'S CHAMPION Prize Winning 8 ft. Gas Model

### Miss Philadelphia

The original model has flown more than 1,000 times with almost 100 flying hours to its credit. It is still in good flying condition. You can easily build a duplicate of this remarkable model with the complete kit described below at the right.

This "RED ZEPHYR" Model is Champion of France! Flew 1 Hr. 20 Min. in Recent Contest for a Distance of 25 Miles!



**RED ZEPHYR** America's Finest Popular Priced Gas Model  
Weight (Less Motor) 2 1/2 lbs.  
Wing Span 6 ft., Length 54 in.

Complete kit includes 3 1/2" pneumatic wheels, Finished Hardwood Propeller, special landing gear brackets, nuts, bolts, wire, all necessary electrical connections, full size pattern plans which make building easy and quick. Complete kit only.

**\$6.95**  
Postpaid Less Motor



ALL THREE OF THESE EASILY BUILT MODELS HAVE WON HONORS IN OFFICIAL CONTESTS!

8 FT. WING SPAN : 57 IN. LONG : WEIGHT (Less Motor) 3 1/2 lbs.  
Gliding Angle, App. 25 to 1 Climb, App. 300 Ft. Per Minute

### KIT IS 100% COMPLETE, INCLUDING

Ready Shaped Leading and Trailing Edges for Wing with Notches Cut for Ribs. Special Design, Fully Finished 14" Propeller. Pneumatic Rubber Landing Wheels. Finished Balsa Ribs with Notches for Spars. Also designed with Crash Proof Landing Gear, Flexible Wing Supports, High Wing Stability, Beautiful Blue and Yellow Coloring, can be powered with Brown Jr., Baby Cyclone "D," Ohlsson or any other standard gas engine—a sensational contest winning model complete in every respect. Kit contains every item required to construct the entire model with liberal quantities of all materials and three extra large detailed plans giving every bit of information needed for building, with photos, diagrams and instructions. Ask your dealer to let you examine a "Miss Philadelphia" kit, or send your order direct.

**\$9.95**  
Postpaid Less Motor

### MISS AMERICA—7 Ft.

First Prize Winner I.G.M.A.A. Contest

Miss America won First Prize with a flight of more than 7 minutes in the 40 sec. limited event at Hadley Airport May 22, 1937. Another Miss America is winner of Grand First Prize at Metropolitan Gas Model Meet at the same airport. This model is a reliable consistent performer in the air, and gives a good account of itself at every model gathering. Designed by America's foremost model designer. Kit is complete with every item required, including 3 1/2" pneumatic rubber wheels, finished hard wood gas model propeller and all other materials required. If you want a reliable flyer for general sport anywhere, ask your dealer to show you this model. Complete kit.....

**\$9.50**  
Postpaid Less Motor

## BUY YOUR ENGINES and SUPPLIES from GAS MODEL HDQTS.

**Scientific Pneumatic Rubber**  
3 1/2" Size for Models 3 to 8 ft. Black rubber. Aluminum Colored Hubs.  
Per Pair .....\$1.50

**Scientific Balsa Wood**  
FOR GAS MODELS  
5 ft. Lengths Each

1/32x3	10c
1/32x4	15c
1/32x5	20c
1/32x6	25c
1/32x7	30c
1/32x8	35c
1/32x9	40c
1/32x10	45c
1/32x11	50c
1/32x12	55c
1/32x13	60c
1/32x14	65c
1/32x15	70c
1/32x16	75c
1/32x17	80c
1/32x18	85c
1/32x19	90c
1/32x20	95c
1/32x21	1.00
1/32x22	1.05
1/32x23	1.10
1/32x24	1.15
1/32x25	1.20
1/32x26	1.25
1/32x27	1.30
1/32x28	1.35
1/32x29	1.40
1/32x30	1.45
1/32x31	1.50
1/32x32	1.55
1/32x33	1.60
1/32x34	1.65
1/32x35	1.70
1/32x36	1.75
1/32x37	1.80
1/32x38	1.85
1/32x39	1.90
1/32x40	1.95
1/32x41	2.00
1/32x42	2.05
1/32x43	2.10
1/32x44	2.15
1/32x45	2.20
1/32x46	2.25
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1/32x58	2.85
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1/32x61	3.00
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1/32x90	4.45
1/32x91	4.50
1/32x92	4.55
1/32x93	4.60
1/32x94	4.65
1/32x95	4.70
1/32x96	4.75
1/32x97	4.80
1/32x98	4.85
1/32x99	4.90
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GAS MODEL PROPS.  
True Pitch, Accurately Carved With Hole Drilled. Made of Clear Hard Wood, Natural Finish. 13" and 14" Sizes

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Each

Accurate Flight Timer, Adjustable 0 to 120 sec. Each, \$3.00.

Accurate Flight Timer, Adjustable 0 to 120 sec. Each, \$3.00.



The new Tush Super Ace Gasoline Engine. A real winner. Price \$21.50, Postpaid. Hard Wood Prop Free with every Engine.



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The finish on a gas model does a great deal in making a successful model. Don't take chances with inferior low-priced finishes.

Clear Nitrate Dope, Colored Nitrate Dope, Nitrate Thinner, Gas Model Cement, Regular Cement, Bamboo Paper Cement, Banana Oil.  
3 oz. bottle.....\$2.25  
1/4 pint can......50  
1 pint can......75



### TO THE SCIENTIFIC MODEL THAT WINS IN THE NATIONALS

We will award \$50 Cash to the SCIENTIFIC Gas Model that takes first place in the 1937 National Meet in Detroit on July 9, 10 and 11, in either the Open or Texaco Events. If Scientific Models win in both events, this award will be divided. Anybody can compete. The Models shown above are all potential winners. Build your favorite, enter the contest and if you win, the Award is yours—no strings or red tape.

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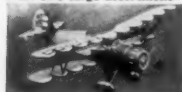
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50" Wingspan, weight 19 oz. Beautiful white, green and silver colors. Ready made landing and trailing edges; shaped and notched ribs, spring action wheels, bridge type landing gear...\$3.00

## Frontiers of Aviation

(Continued from page 11)

The Sikorsky is well under way as are the two Boeings. The Boeing flying boat will be a wonderful ship. It will have very smooth lines. The huge wing is of good taper and fairs into the top of the hull. Large sponsons are employed instead of wing floats and when the airplane is docked the sponsons may be used as a platform for loading and unloading. Passengers may step from the dock onto the sponson and then into the cabin. In the nose of the hull is all the equipment necessary for mooring. Aft of that is the pilot "bridge" with part of the passengers' quarters directly below. In the center on top of the hull is a small observation compartment where one can look out over the wing and see a wonderful view in any direction. Passenger accommodations extend very far aft, almost to the leading edge of the fin. The four engines are located in the leading edge of the wing and are accessible from the hull by passageways through the wing. Incidentally this is also a feature of the very latest Boeing four-engined XB-15 bomber just completed. The engines used in the Boeing "314" flying boat will be the new 1,500 hp. twin row Cyclones.

From present rumors we hear that the new Boeing four-engined XB-15 is four tons heavier than the YB-17 and is certainly much larger.

In comparing the new Boeing and Douglas four-engined landplanes it is found that they will differ considerably. The Boeing as you will note in the table is much the smaller but is faster. The Douglas is the only transport in the list that will have a wheel in its nose instead of a tail wheel. The Douglas-Klinehans job is still about twenty years in the offing.

The future of the Curtiss transport is still a mystery, but it is very likely that Curtiss will soon come forth with something very surprising. Of the planes on the remainder of the list all are definitely under construction. A great many of the Short boats have already been built, and the first of the Armstrong-Whitworths is about to take the air at this writing. Both of these airplanes are England's answer to the call for large airplanes. The Dornier DO-20 is the modern version of the DO-X and is Germany's only bid for air transport supremacy at this moment. Not much has been obtained on the French Latécoère 521 boat, but what has been drifting from the company's plant shows that the Latécoère engineers are very optimistic or else available details of the plane are erroneous.

The Maxim Gorky type transports (we have no other name for them) are Russia's latest. The airplanes listed are all commercial transports and have four engines or more and about seventy-five percent of them are American made! Mr. C. G. Grey, English editor of "The Aeroplane" and lover of American aircraft though sometimes his writings show otherwise, has this to say about the matter. "Details have arrived from America of the 'largest flying boats in the world' which Boeing is building for the transatlantic

service. They will weigh between 40 and 50 tons and will carry 72 passengers and a crew of eight. According to this they will be a little lighter than the DO-X, which weighed 53 tons and carried 169 passengers, but the Americans must have the largest in the world, so possibly they will manage to discover an extra ton or so, as the French did for the 'Normandie.'"

We have left out details of such airplanes as the Sikorsky S-42s and Martin Clippers because they are not of the very latest and details of them can be found so easily elsewhere in former issues of MODEL AIRPLANE NEWS. Because government officials froth at the mouth every time a new mystery ship is mentioned in print we have also eliminated that category. As we have stated before there are four huge planes being built in this country for military purposes, namely the two Boeing bomber types for the Army and the Sikorsky and Consolidated four-engined flying boats for the Navy.

We have heard some details of the Consolidated ship which would not disclose any military secrets. It will be of conventional design with its high-wing fairing into the top of the hull. Wing floats are the same as those on the present Consolidated twin-engined Navy ships except for larger dimensions. They fold into the wing tips. A machine-gun turret is located in the extreme nose of the hull and one directly under the trailing edge of the rudder with others scattered about the huge plane. They will dissuade any enemy from becoming too neighborly. The four engines will be located in the leading edge of the wing as usual.

In England still another four-engined transport has been built but it perhaps would not be classed as a giant though it weighs 25,000 lbs. and will compete against the largest in transatlantic service. It is none other than the DeHavilland Albatross which has recently been completed and test flown. It is truly an excellent airplane. As far as streamlining is concerned it is the best we have seen yet. The ship is a low-wing monoplane with its four engines projecting at some distance in front of the wing like oversized bullets. They are inverted V-12 DeHavilland 500 hp. engines with the bullet-shaped nacelles completely enclosing them which gives the airplane a very "racy" appearance. The fuselage is long, slim and monocoque with very smooth surfaces. Two rudders are located at the tail. The landing gear retracts inward into the bottom of the fuselage. Top speed is 250 m.p.h.

Again Walter Winchell comes forth with some news on another new ship. According to him Douglas is building a 50 passenger airplane with a crew of nine which sounds like it might be a flying boat

### CORRECTION

The Scientific Model Airplane Co.'s advertisement in the June issue listed their "Miss America" gas model as weighing 25 lbs. This was an error since the correct weight is 2 1/2 lbs.



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—Dural 17st., air-cooled with symmetrical finning designed for correct plug operating temperature. Head gasket special material.

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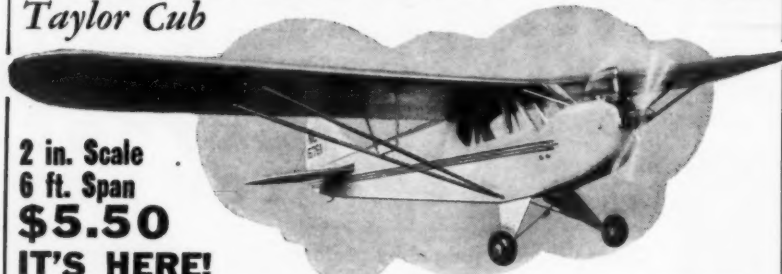
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*Taylor Cub*



2 in. Scale

6 ft. Span

**\$5.50**

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Complete Kit, less motor, with balsa wheels.....  
Complete Kit, less motor, with pneumatic rubber airwheels and single pole double throw snap switch.....

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3088S W. 106th St.,

Cleveland, Ohio

or probably he got his signals mixed and meant the new DC-4.

There is news that Lee Schoenhair will be the pilot of the new super Kieth Rider racer now being built.

The Turner-Brown controversy has seemed to be quelled fortunately and from present indications it appears that the wing on Roscoe Turner's racer will be enlarged. We hear that previously the racing plane had only 75 sq. feet of wing area with a span of 20 feet! The pilot sits in the tail end of the fuselage.

Bill Ryan, editor of the "Pilot," came forth last month with details of the latest Bellanca airplanes such as their new low-wing single, twin and three-engined low-wing airplanes now nearing completion. Accompanying was a statement that he bet his readers had never seen details of these planes in print before. Those who read *MODEL AIRPLANE NEWS* thoroughly could take Mr. Ryan up on that bet for we claim to be the first magazine ever to mention Bellanca's twin-engined airplane in our issue that came out on April 1, 1936! Since then we have narrated news on Bellanca's new single-engined and twin-engined low-wing monoplanes several times, but we must admit that Mr. Ryan did outscore us on Bellanca's new racer. It is the one for that New York-Paris race and will have three engines! "The Pilot" states that it will have two Menasco super-Buccaneer engines in the wing and a Ranger engine in the nose.

While these three new airplanes are being completed and perfected, Bellanca has been building 20 "Flash" racers converted into mailplanes for the airline "Air France" of France! Most of these ships have been completed and are almost identical to Mollison's transatlantic ship. They are powered by 900 hp. Twin-Row Wasps and carry a crew of two and 1,000 pounds of mail with speeds faster than

any other transport in the world.

Flight tests have been conducted with Lockheed's new sub-stratosphere Army plane.

The Curtiss Company was presented with a contract by the Navy totaling \$2,119,687 for 83 new VSO type scout-observation airplanes.

## How to Build a Model of the Northrop A-17 Attack

Here is one of the latest Army attack planes with plenty of speed to its credit. Make the entire model from balsa wood which may be purchased in any model shop or department store. Shape out all the parts of the model first before beginning the assembly.

Make the fuselage first. Draw the top elevation on stock and shave down the sides with a chisel and razor blade. Then draw on the side view and cut around this outline with a saw or chisel. The underside of the body should be cut away from the wing center section. Whittle down the corners of the fuselage with your razor blade to the contours shown by the cross-sections on the plans. Go over the surfaces with coarse and then fine sandpaper. Hollow out the nose for the dummy engine, which may be made of balsa also.

Make the wing center section and right and left wing panels next in like manner. Draw the outline of the top view of each wing and cut. Then taper down the wing as shown by front view and cross-sections. Cut out the center section, hollowing out the holes for the landing gear.

The tail is very simple to make. Shape the rudder, fin, stabilizer and elevators from balsa and sandpaper them to smoothness.

Whittle one two-bladed prop from small scraps of wood. The blades may be made individually and then joined to the small

hub with model cement.

Cut the landing gear struts from dowels, cutting them to the form shown in the drawing. It is best to purchase the wheels though they may be made if you prefer.

Go over all the parts with fine sandpaper and brush off all dust. Then begin the assembly. Lay the wing center section on a flat surface in flying position and fit and cement the body to it. Then join the wing panels, one at a time, with blocks underneath them to hold them in place. Use model cement to join them. It is important that you be very accurate in this procedure. The next step is to join the tail surfaces and put the engine in the cowl. Raise the model higher and install the landing gear. Apply plenty of cement. The prop may be joined at the cowl with a small straight pin as a shaft. Use sheet celluloid for the cockpit enclosure.

When all parts have been assembled, go over the model once more with fine sandpaper and then brush off all the dust. Paint the entire model light Army blue with proper Army markings as shown. The tires on the wheels and the front of the cowls should be black. Many coats will have to be applied before a smooth finish is obtained. Do not apply a second coat until the first has dried. It is best to again sandpaper the entire model after the first coat before applying the others. After the paint job is accomplished, the model will be completed.

The drawing shows details not mentioned in the directions for the simple construction of a scale model which the builder may add if he wishes to.

## The "F-50" Cyclone in Miniature (Continued from page 15)

chamber. It runs at low speed and operates on plain roller bearings, mounted on the crankshaft. This unit keeps the engine's performance uniform at all heights.

### Building the Cyclone "F-50" Model

If you are planning to build an authentic scale model of the "F-50" for a model airplane, use the same scale in full proportion with both the engine and airplane miniatures. To make the last statement clear, if the model airplane scale is  $\frac{3}{8}$ "; the engine scale is  $\frac{1}{32}$ " equals one inch or the engine scale is also  $\frac{3}{8}$ ". After you have the scales all worked out, use the engine's scale throughout the entire building of the "F-50."

### Motor Block

The first piece to make is the motor block (Figure 1 on plate 3). Use your scale to find out the width, height and thickness of this block; obtain a straight-grained piece of wood whose dimensions are a half inch over the dimensions of the block's. On the front and rear sides of the block, after the exact thickness has been reached, draw the vertical and horizontal center lines. Form the centers of the two sides, draw a circle equal to the scaled radius of  $11\frac{3}{4}$ ". Scribe also from the same center on the front side, another circle equal to the scaled radius of  $9\frac{3}{4}$ ". At the top, where the vertical center line meets the largest circle, divide the circle



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A Guaranteed Kit

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IS A SUPER QUALITY model that is scientifically designed that will give amazingly long flights, either from the hand or off the ground. All parts of the Moth are beautifully moulded in the form of light, hollow shells, perfectly shaped and fully detailed. The fuselage shells are firmly fused together, forming a perfect, crashproof fuselage. All wing surfaces are moulded to the correct wing curves and are completely finished. The moulded hollow streamlining struts are remarkably strong when cemented together. The "Moth," when assembled is practically crashproof and will stand up under the most severe flying punishment. Be the first to fly the Moth in your neighborhood. Ask your dealer—if he can't supply you send direct \$1.50 plus 15c postage.

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into 9 equal segments. At the end of each segment, mark a point which will total 9 in all. From the center of the engine, draw 9 cylinder center lines that will pass through the points on the circle. You will get a better idea of this layout if you refer to Figure 18 on page 2. On the points where the cylinder center lines meet the circle, draw 9 lines that will be at right angles to the cylinder's center lines; these newly formed lines are the angles of the cylinder's bases. Now use your own judgment in cutting away the surplus of each base, and when completed, see that all angles are equal and are square to both the rear and front sides. Now draw the two right angle center lines on each base and mark each center. On these centers, drill 9 holes "A" toward the center of the engine. Drill the holes large enough to admit the size of your chosen dowels. Drill at the front side through the rear side, a hole large enough to lighten the block without harm. The hole as shown in the drawing (Figure 1) is sufficient.

### Rear Sections

Now make the piece for Figure 2 of any material that you choose. When finished hollowing out the center, glue the piece on the exact center of the rear side of Figure 1. The unit as shown in Figure 3 is next to make. I suggest that it should be made in three pieces (not counting the mounting gadgets and intake ports); two thin layers for the thin outside rims (two) and a thick piece for the center. After the center piece has been shaped, make the 9 mounting gadgets and attach; finish off the entire piece to resemble the drawing and then add the two outside rims later. When completed, hollow out the center to your best judgment but make sure that the top is closed up like the drawing shows. Glue or attach Figure 3 to Figure 2 on the motor block.

Now make the complete unit for the supercharger chamber (Figure 4). The heavy center piece can be made on a lathe,

cutting off the top of the piece as shown on the drawing. After the piece is carefully hollowed out, drill a hole through the location of the gun synchronizers (refer to the top-view drawing on page 1). Add all small plain bases (odd ones) for different parts now, then add a thin layer (heavy paper will do) to cover up the back; and on top of this layer, lay another thin layer to represent the bolted rim. When completed, glue the entire unit onto the exact center of the back of Figure 3.

### Cylinders

The nine cylinders should be made next. On Figure 11 of page 3, you will get a suggested idea to make a lifelike cylinder. On page 1, the four-view drawings of the cylinder design will give you a broad idea of the cylinder's appearance. From Figure 11, it is suggested to make the whole cylinder head into halves. The lower unit can be made on the lathe and finished off to exactness, by winding thread at the proper place. Before threading, it is best to drill through the center, to insert a dowel that is the same size as the holes "A" on Figure 1. It is also suggested that the upper half should be built up of alternating layers and that the rocker houses should be carved separate from the block as shown on Figure 11. (It's best to not attach the houses until it is all carved). When the entire upper half of the cylinders is finished, glue the two halves together and attach to the motor block, one at a time.

If the model builder wishes to make an exact pattern of one cylinder and cast the others from this pattern, here are my suggestions. On the market, there is a company that manufactures liquid rubber in two states (conditions) that will enable anybody to make flexible moulds. To use this method, the pattern must be made first and the first rubber is applied like paint; the second rubber is applied like putty to a window. This company's (So-Lo-Go-Ma Works of Cincinnati, Ohio) product comes in two cans, called "Number 1" and "Num-

ber 2." Number two is painted on the pattern in six or more coats; each coat is applied after the last coat is dry (Figure 12). When a sufficient thickness of number two is obtained, then spread on Number one (Figure 13). Put the mould away after a sufficient thickness of Number one is secured and let it stand for about 24 hours. When Number one is dry and hard, cut an opening around the mould in such a way that it will permit you to remove the castings with the greatest ease (Figure 14). On Figure 15, you will see that adhesive tape is used to keep the opening together and that the dotted box is a suggested support for the mould. Make the support out of plaster or a carved block. Turn the block around as it appears in Figure 16. Also in Figure 16, you will notice how to sift the plaster into the bowl of water. To make the proper plaster mixture, use plaster of Paris, fill up the mould with water and dump the water in a bowl. Now add the plaster as shown in Figure 16; be careful to build up an even pile and when the plaster is even with the water, let it stand for 10 minutes. Then slowly mix the plaster with a circular movement for a few seconds. When through, pour the plaster into the mould very slowly to prevent the formation of air bubbles. Put the mould in a warm dry spot to harden; when the plaster is hard, remove the tape and carefully open the mould to remove the casting.

### Miscellaneous

Figures 5, 6, 7, 8 and 9 can be made with the same procedure as employed in making the other units. After all these units are finished, attach them to the motor in their proper position. Now make the intake tubes of soft wire or anything that you think is best. Now paint the entire unfinished engine according to the information set on page 3. (Don't paint the surface inside of the guide circle). Attach the finished wire harness (Figure 10) which must be painted before attaching, with all its fix-

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7" per doz.	.09	.11	.12	.13
8" per doz.	.10	.12	.13	.14
9" per doz.	.11	.13	.14	.15
10" per doz.	.12	.14	.15	.16
11" per doz.	.13	.15	.16	.17
12" per doz.	.14	.16	.17	.18
13" per doz.	.15	.17	.18	.19
14" per doz.	.16	.18	.19	.20
15" per doz.	.17	.19	.20	.21

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1 1/2" sq.	.01	2" sq.	.02
1 3/4" sq.	.02	2 1/2" sq.	.03
1 7/8" sq.	.03	3" sq.	.04
2" sq.	.04	3 1/2" sq.	.05
2 1/4" sq.	.05	4" sq.	.06
2 1/2" sq.	.06	4 1/2" sq.	.07
2 3/4" sq.	.07	5" sq.	.08
3" sq.	.08	5 1/2" sq.	.09
3 1/4" sq.	.09	6" sq.	.10
3 1/2" sq.	.10	6 1/2" sq.	.11
3 3/4" sq.	.11	7" sq.	.12
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tures to the engine. When the harness is attached, add the baffle plates and oil passage line. Now add the correct gear housing on the nose of the engine; make sure that it is on the guide line as shown in Figure 1. When the gear housing is secured to the block, add all the cam rods, bolts and the oil strainer system. When the entire model is all painted and polished, add all the metal gadgets. They are so numerous that space does not permit me to put it all down in writing but you will get a broad idea of the quantity of these details by referring to the assembly drawings. (The "87" band on the intake pipes is painted red-orange, the intake pipes are a shiny black color . . . the same color is used on the baffles, name plates and other similar devices.)

## Patrol Planes of the U.S. Navy (Continued from page 5)

rudders which were placed above the stabilizer.

The fuel was kept in tanks in the hull and pumped to gravity tanks in the leading edge of the center section. The oil was carried in tanks located in the center section over each engine nacelle.

Consolidated soon came out with a commercial version of the XPY-1 which was known as the "Commodore." Fourteen of these planes were purchased by the N.Y.R. B.A. Airlines for operations between New York and Buenos Aires. The "Commodore" was of the same design as the "Admiral" or XPY-1 except that the hull of the commercial plane was modified to accommodate passengers and baggage and radio compartments. On the "Commodore" a crown deck was substituted for the cylindrical deck of the patrol boat to provide additional headroom for the passengers and sufficient height for the installation of sleeping berths. The cabin consisted of five separate compartments each having its own ventilators. The "Commodore" could be fitted up to accommodate either 22 or 30 passengers plus a crew of three. The additional passenger capacity was provided by sacrificing one or more of the mail compartments. The 25-place flying boat was known as Type 1 and was powered with two 575 hp. Hornet Bs. The 30-place plane was referred to as Type 2 and was installed with two 660 hp. Hornet T2D-1 engines. The ship could also be equipped with three Wasp engines. Many of these old-time flying boats are still used in South America but are gradually being replaced by more modern equipment.

A few years after Consolidated went into the naval patrol boat construction field the company produced an improved version of the XPY-1 that was designated the P2Y-1. This new patrol boat was a sesqui-plane unlike its prototype which had only an upper wing. The P2Y-1 had a short lower wing that was attached to the roof of the hull with two small auxiliary floats suspended from the lower wings near the wing tips. The plane was powered with two 600 hp. Cyclone R-1820-E engines. Again, as in the PY-1, placement for a third engine was provided in the upper center section panel. The P2Y-1 accommodated a crew of five. The pilot's compartment was enclosed and was equipped with dual controls. One of these patrol boats was purchased

by the Colombian government, twenty-three were purchased by the U.S. Navy in 1931 and twenty-two others purchased and delivered during 1933. The Navy has all of these patrol boats in active service at present.

Many records were established by the P2Y-1 type. In January, 1934, a world's record was set by Squadron 10-F when six of its patrol boats flew in mass formation from Norfolk, Virginia, to Coco Solo, Panama, a distance of 2,059 miles; then to Acapulco, Mexico (1,676 mi.); and finally to San Diego, California (1,616 mi.). After these strenuous undertakings the same six planes flew from San Pablo Bay, California, to Pearl Harbor in the Hawaiian Islands, covering a distance of approximately 2,408 miles. All these flights were under the command of Lieut. Commander Kneifer McGinnis. The last flight that the six ships made broke the former record established by Commander Carpenter in September, 1933, when he was ferrying a new delivery of P2Y-1s. The Hawaiian flight was the longest non-stop flight made by a seaplane and the record was held till broken on October 20, 1934, when Mario Stoppani flew from Montfalcone, Italy, to Massaua, Africa, a distance of 2,566 miles in an Italian seaplane.

Italy has always been well known as a builder of seaplanes and flying boats. During the same year that Commander Carpenter set a record with Squadron 5-F, General Italo Balbo with twenty-five seaplanes of the Italian Air Force flew from Orbetello, Italy to Chicago, Illinois, via Iceland and Labrador, and then back to Italy on a southern route. This was the greatest mass flight ever made in aviation history and has remained as such to the present day. A flight like this is hardly imaginable. Just visualize twenty-five Savoia-Marchetti S-55 X flying boats sweeping across the sky, powered with two 550 eighteen-cylinder Isotta Fraschini Asso "W" engines, which were mounted above the wing.

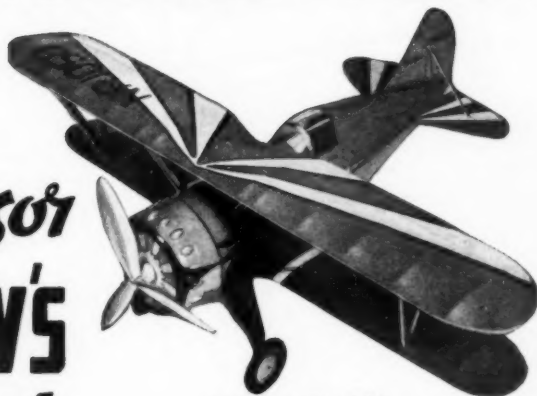
During 1933, the same year that General Balbo and his crew flew to fame and Commander Carpenter made his record flight, Consolidated produced another naval patrol boat, the XP2Y-2. This boat was a modified version of former Consolidated flying boats, in that the two Cyclone engines were located in the leading edge of the upper center section instead of between the wings as in earlier models.

It was about this time that other aircraft manufacturers, encouraged by Consolidated's previous successes, became interested in patrol boat construction. However, due to Consolidated's continued concentration in this line, the other manufacturers apparently did not attain the favor that Consolidated had gained with the Navy, as evidenced by continued purchases of Consolidated flying equipment.

The most popular of all the Consolidated patrol boats is the P2Y-3, also known as the "Ranger," that appeared soon after the P2Y-2. The P2Y-3 is powered with two 700 hp. Cyclone R-1820-90 engines located in the leading edge of the top wing. The engines are equipped with two 3-bladed electrically-controllable pitch propellers. Twenty-three of these ships were delivered to the U.S. Navy during 1934, and six were built on an order from the Argentine gov-

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Postage  
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A brand new MEGOW model kit of this famous Grumman now touring the country. Duplicate of the latest navy fighting ship, plus new features added by Major Williams.



Colonel Clarence Chamberlain holding a Megow gas-powered QUAKER FLASH. His new plane for racing and high altitude flying MISS STRATOSPHERE, is in the background.

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in a larger slower ship. Build cleanly even when your work will not be noticed and you will not have the unnerving experience of seeing your gas job "moult" high in the air.

If no changes are made in the design, the first flight should be made with the front strut of the wing mount directly over the No. 2 bulkhead. If anything, this adjustment is slightly on the diving side. If you doubt the wisdom of this, ask a friend who has ever had the nightmare of watching his gas job seesaw all over the landscape—up and down, up and down, and finally down! In a slight dive, a model will scoot all over the lot until the gas is out or the switch is cut, and, barring trees, walls, pedestrians and such, will end up little the worse, save for wear on the wheels and the breathing organs of the poor builder who is always accorded first chase. A bike is a great asset at a time like this.

As far as the turn for your first flight is concerned, the safest thing to do is sit down and figure out just what adjustments will keep the model in a straight line. It will probably turn anyway, but it won't spin. Notice the models behavior closely, and adjust it with the rudder flap for a 40 or 50 foot circle with the torque for its second flight.

We think this new idea of making gas jobs a reasonable size is the greatest (or should we say smallest) thing that has hit gas-jobbing so far, and after your first Cloud-Kisser, so will you!

### Build This Flying Burnelli Transport

(Continued from page 23)

through the pattern and into the disc. In this manner, the pattern is held in the same place throughout the cutting. Now cut the teeth with a razor blade or razor knife and file to a final close fit with a 3-cornered file or a prepared stick of fine sand paper the same shape of the file. Remove the pattern and pin and insert a straight pin. As each gear is made, dip it in cement and brush surplus off. When dry, repeat the process of dipping. After three or four coats have been applied and the gears have smooth glossy coats, they are ready to use. If the teeth have not been brushed off properly, they may be wavy, but refiling will get them back into shape. If filing again is necessary, dip the gears in thin dope or banana liquid and brush surplus off, to keep the teeth smooth.

Drill 1/16" holes through the cross bar

(it should not be installed until the movements are on it) exactly 7/16" O.C. and insert 1/4" lengths of 1/16" aluminum tubing for bearings. Insert the shafts through the bearings and the gears with washers between, the same way a propeller is mounted, but do not cement either the tubing or the shaft until the gears are found to run smoothly. It may be necessary to move the bearings closer or farther apart. Cement the bearings first and let them dry before bending and cementing the shafts to the gears. Install the cross bar movement assembly in place at the rear and cement former C in the center.

To use the Hovespian movement, cut the middle shaft off close to the frame and proceed as per drawings.

### Assembly and Covering

Cover the booms on both sides from the rear to the first spacer. Cover the bottom and attach landing gear and tail wheel. Cover sides and cement celluloid inside the windows. Cover top and cement booms in place and then the tail surfaces on them. Make the cockpit cover frame of 1/32" sq. bamboo, and cover with celluloid. Make the pair of wings, cover and attach to fuselage so that the spars are in line with the main beam of the fuselage and the contour of the wings line up with the top longerons of the fuselage. Cover remainder of booms and cut 1/16" x 1/4" streamline struts and fit them to the wings, noting that each wing has 1" dihedral at the tips. Make two 1/32" sheet balsa hatch doors and hinge them on with tissue. Power the model with two loops of 1/8" flat rubber to each half motor and put a few drops of heavy oil on the gears. Spray the model lightly with water to tighten the tissue and apply a thin coat of dope.

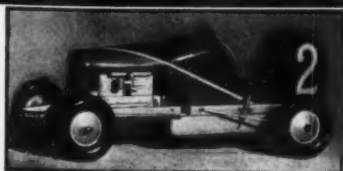
### Flying the Model

It strains the movements to wind by the propellers, so use a double winder. Stretch and wind each side at a time and put in the same number of turns. Slip the "extra stabilizer surface" on and glide until the model has a flat glide. Keep increasing the number of turns of the motors, then, until satisfactory flights are obtained, by making adjustments after each flight.

### List of Materials

#### Balsa

- 2 medium 3/4 x 1 x 4 1/4" flying props.
- 2 hard 1/4 x 3/8 x 4 3/8" scale props.
- 2 medium 1 1/4 sq. x 2 1/2" cowl blocks.
- 1 hard 1 1/4 sq. x 2" wheels and nose plugs.



12 1/2" MIDGET RACE CAR KIT 12 1/2"

Accurate scale model, complete with all wood parts cut to shape, cowl and hood of alum. pressed to shape, axles drilled and threaded. Springs finished. Nothing else to buy. Plenty colors, cement and wood filler. Shipped Postpaid. \$3.00.

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In 32 Colors

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JAP-FIBRE paper superior to silk for GASOLINE POWERED MODELS. Weight and strength properly proportioned. Natural shade. Handmade.

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STANDARD TYPE

BROAD BLADE  
50% More Efficient

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4 sizes: 1 1/2"; 2"; 2 1/2"; 3"

Another Japanese Import

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ONE OF THE HUNDREDS OF LETTERS WE RECEIVE  
336 Myers Pl., Inglewood, Calif.  
May 23, 1937.

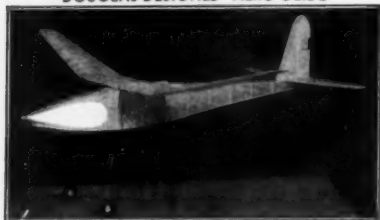
Mr. Douglas Kruse.

Dear Sir—  
I thought it might interest you to know that a model made from one of your Aero-Glide Kits made a beautiful flight of 32 minutes plus to-day near Gosh Airport near here. After the folding prop closed the ship started to soar in about 300 foot circles and max. altitude was about 2000 feet. We followed the ship and were at hand when it landed 3 1/2 miles from the starting point. Landing gear, M & M wheels & all complete. Sincerely yours,

WILLIAM L. BUTLER.

Senior Naval Aircraft Inspector U.S.N.

DOUGLAS-DESIGNED AERO-GLIDE



PATS. PENDING ON AUTOMATIC PROPELLER  
Wingspan 41", length 30", wt. 3 oz. Kit contains all parts to assemble folding propeller—MANCO BALL BEARING propeller shaft—M & M model wheels—special brown contest rubber motor—glue, dope, tissue, wing ribs and other parts printed "on AAA" sheet balsa—all strips cut to size—full size detail 3-view drawing.  
"Aero-Glide" Kit complete \$2.25 Postpaid, U.S. and Can.

- 1 medium 1/16 x 2 x 12" sheet formers and struts.
- 1 soft 1/16 x 2 x 12" fus. leading edge.
- 1 medium 1/32 x 2 1/4 x 8 1/2" stab.
- 6 medium 1/32 x 2 x 12" other sheet parts.
- 1 medium 3/8 x 1 1/2 x 3" cowl discs.
- 1 medium 3/16 x 1/2 x 2" to make chan. blocks.
- 1 3/8 x 3/8 x 6" main beam.
- 1 3/8 x 3/16 x 6" cross bar for rear of motors.
- 3 3/8 sq. x 12" leading edges, etc.
- 2 1/16 x 3/16 x 12" trailing edges.
- 12 1/16 sq. x 12" fusel., spars, spacers.
- 2 Hovespian movements as shown (optional)
- 1 sq. in. thin hard sheet alum. hinges, pattern.
- 1 doz. 3/8" model washers.
- 2 sheets colored tissue.
- 4 1/32 sq. x 12" bamboo strips.
- 3 oz. clear model dope.
- 2 oz. good cement.
- 1 24" length No. 12 wire hooks, shafts, fittings.
- 1 4" length No. 8 wire L.G. fittings.
- 1 10" length 3/8" dowel rod. L. gear struts.
- 1 6" length 1/16" alum. tubing bearings.
- 60 inches 3/8" flat black rubber, lubricated.
- 12 1/32" sq. rubber for landing gear.
- 1 5/8" tail wheel.

### Building "Little Tick"

(Continued from page 21)

switches. However, as these mechanisms were not designed for this purpose, the time range of most of them is not large enough to permit long flights. The Eastman Kodak timer is an exception. Due to the principle upon which it works, it can be set for periods of as long as three minutes.

It is unsatisfactory to a certain extent because the temperature and humidity affect it to such a degree that its dial cannot be accurately marked off. This makes it necessary to recalibrate it before each day's flights.

So far, most of these timers had to be mounted on the outside of the fuselage to facilitate the winding and setting of them.

Setting them, while not being complicated was still not a simple procedure for the switch had to be closed, the timer wound



This model equipped with Free-Wheeling Prop. Wing span 36", length 27", wt. 2.8 oz. The new "Space Conqueror" Hydroplane, Landplane and Skiplane—all in one model—change from one to the other in two minutes. This model has an unofficial record of 19 min. 25 sec., 3500 ft. altitude with M & M Model Wheels. And two to three minutes with pontoons and skis. It takes off just like a real plane. Is very easy to build, and the flights it makes are really amazing.

Complete Kit with M & M Model Wheels, \$1.75 P.P.

Send Money Orders or CASH only. When sending cash fasten coin to letter with adhesive tape. If located in Washington add State Tax.  
Send for Catalog of gas model supplies and everything to build rubber powered models. Complete line of M & M Model wheels.

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and set, and a catch placed to keep it from running until the plane was ready to take off. Some had to be set in motion before the motor could be started.

After reading this far it would appear that I do not like these camera timers. This is not so, for I have seen plenty of them perform splendidly. So it was with the idea of doing away with all of the above mentioned "faults" that a new timer called "Little Tick" was developed.

"Little Tick" is very dependable and has a perfect score to date, over a hundred flights being successfully completed.

Having a run of from ten seconds to three minutes it operates at a constant speed and once the dial is marked off it never has to be recalibrated for neither heat nor cold has any effect upon it. A switch is built into it and still the total weight is less than two ounces.

Mounted inside the body, a small shaft, with a pointer affixed, extends through the side of the plane. The dial is mounted on the outside of the fuselage. Only one operation is required to wind and set it, close the switch and set it in motion.

It is built in the frame of a small clock, the escapement of which controls its speed.

In building "Little Tick," first secure a small clock of the type found on most night tables. You might have one in the house; if not, they are inexpensive when new and may be purchased for a song at most pawnshops.

To begin with, the clock is taken out of the case and the hands and face are removed.

Before taking it apart further, study the accompanying drawings making sure that you know just what is to be done. Few dimensions are given. This is due to the fact that most clocks differ in size, but no matter what size clock you obtain, it can be adapted to the timer.

Now getting back to the clock, note the positions of the gears together with their functions. You will notice that the center post, or the shaft to which the hands were attached, is geared to the spring on one side, and on the other to a train of gears leading up to the escapement. This last set of gears leading to the escapement wheel are the only parts used, so the spring

and center post are removed. If the clock has an alarm, this is also discarded. When these parts have been taken out, the frame will be half empty, so in order to save weight the empty part of it is cut off. The frame has to be taken apart to cut it accurately. In removing the balance wheel, be sure that the hair spring attached to it is not stretched or strained in any way.

When all the parts have been removed both sides of the frame are clamped in a vise and the sections which housed the spring and the alarm are cut off.

The spacer bars may have to be re-located. The holes for them can be drilled while both sides are still in the vise.

It is important that the holes be directly opposite each other so that the gears will fit perfectly.

Next, the first gear in the train, the one which meshed with that on the center post, is removed from its shaft and its hub is drilled out so that a length of 1/16" diam. drill rod can be inserted.

A U-shaped strap cut from 1/32" brass, with a small piece of the clock spring riveted to the bottom of the U, is placed around the gear on the shaft. It should be separated from the side of the gear by spacer washers. Then its ends are soldered to the shaft.

Drill out the bearings on the frame to accommodate this larger shaft and reassemble the works.

When the new shaft is rotated, the gear does not turn with it but the U-shaped strap does. The curved spring on top of the strap slides over the teeth of the gear and acts as a ratchet. That is, when it is turned in one direction it merely slides over the teeth but coming back it engages these same teeth and turns the gear with it. As the gear leads to the escapement, the speed at which the shaft turns is accurately controlled.

A small coil spring wound from fine piano wire and placed on the shaft, supplies the power to return the shaft to its starting position.

The switch is built on the outside of the frame and is actuated by a small arm soldered to the shaft which protrudes from the case.

A piece of fibre 1/16"x3/4"x1/2" is riveted to two brass brackets which are then soldered on the frame.

The contact arm, made from a piece of the old spring, is grounded to the frame. A contact point made by cutting a small slice off a 3-inch nail, is soldered to the arm at a point directly below the center of the fibre plate. The upper point, on the fibre plate, is a small flat head screw.

If the contact arm were to reach the lever on the shaft, the arm itself would bend between the contact point and the end of the arm and more power would be needed to open the circuit. In order to prevent this, a short stiff piece of brass soldered to the arm near the point makes contact with the lever.

Now after describing how the parts are built, here is the way they work.

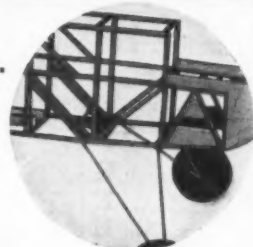
When the timer is at rest, the lever on the shaft rotated by the spring holds the contact arm down separating the points. When the shaft is turned, the lever moves with it, closing the points, the claw sliding over the teeth of the gear.



AIR CHIEF

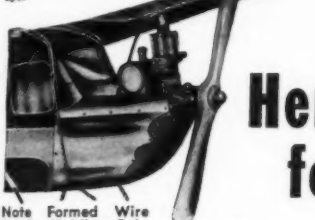
IDEAL'S  
I.G.M.A.A.TROPHY  
WINNING

GAS MODEL

FLEXIBLE SPRING  
SHOCK PROOF  
LANDING GEARDOUBLE DIHEDRAL OF  
WING INCREASES FLY-  
ING STABILITY

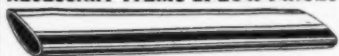
Wing is constructed in three sections—center section and two end sections. Center section frame work constructed of hard, strong Bass wood; ends and tips of Balsa. Dihedral is constructed between center and end, and an additional dihedral designed into extreme tips of wing, thus securing the double dihedral which all builders agree is necessary in large models.

Note engine mounting with high thrust line. Solid balsa block shaped and built into nose to give necessary rigidity and protect motor against cracks.

Note Formed Wire  
Hooks Holding Rubber  
Strands Over  
Wing.PRIZE WINNING MODEL BY  
STEPHEN KOWALIK

Winner of Junior Motors Trophy  
for Consistency in Flight.

This is the actual model, designed by Stephen Kowalik, which took first place in the I.G.M.A.A. Contest, May 9th, 1936, for greatest consistency of flight with the greatest time for any three official flights—average six minutes for each of three flights using 5/16 oz. gas. Nearest competitor averaged three minutes per flight. This same design took 5th, 6th, 7th and 9th places in the same contest. Stephen Kowalik has designed this duplicate of his Trophy Winning Model so you can build an exact duplicate for yourself!

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**STREAMLINE TUBING FOR GAS MODELS**  
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**Gas Model Battery Case**  
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Ready formed of 3/32" wire, two sections joined together as illustrated. Threaded ends complete with nuts, ready to mount and attach wheel. Suitable for any gas model. Complete \$2.00. Postage 15c extra.

Here's the Gas Model You'll Want  
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WHETHER you want a gas model for general sport flying in your own way, or for keen competition against all comers—this is the model you should have! This is a reliable, consistent flyer which can be powered with any standard engine, and will give you the thrills which come only with powered flight. At the same time it will hold its own in official contests. Is easy to build and has many exclusive IDEAL features found in no other model. Read the following list and compare this gas model with all others—then you will decide this is a model you want!

## THESE DISTINCTIVE FEATURES MAKE THIS MODEL THE BEST BUY OF THE YEAR!

- Double Dihedral Built into Wing Increases Flight Stability and Rate of Climb
- Bass Wood Fuselage Framework Gives Greater Strength
- Special Bass Wood Center Wing Section Adds Strength Where Most Required
- 25 Die-Cut Balsa Ribs Fully Finished and Notched
- Ready Made Battery Case With Soldered Terminals and Tension Coil Spring
- 3 1/2" Pneumatic Air Wheels. Wood Screws and Model Nails Included in Kit
- Parts for Tail Assembly Including Ribs, Edges and Tips Clearly Printed on Balsa
- Rudder Position Adjustable. Angle of Incidence Variable. High Thrust Line.
- Plans Include Diagrams and Instructions for Installing Any Popular Make of Gas Engine
- Plans Include Patterns for Both Halves of Wing
- Special Landing Gear Struts (3/32") Fully Formed, Threaded and Complete with Nuts
- Special Shock Absorbing Spring Landing Gear Mounted Inside Fuselage
- Wire Hooks for Holding Wing Anchoring Rubber Supplied Ready Formed—Rigid Yet Flexible
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Kit contains all the above special features which can be incorporated into this model, including selected Bass wood strips for fuselage and wing center section, all necessary hardware, rubber strands, gas model cement, bamboo covering paper, etc. 2 sheets are included reproducing every detail of the Model in Full Size Pattern—Plans with detailed instructions for building the entire model, so easy anyone can follow them. This Kit is absolutely complete with every feature mentioned above. Compare with any Kit on the market and convince yourself of its dollar for dollar value.

**MODEL AIRPLANE DEALERS:**—We have delayed bringing out a Gas Model until absolutely sure the model kit we presented would represent the utmost value possible to produce for the money. Here it is! Write for dealer discounts and get full particulars on this opportunity for profit!

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City Book Agency, 70 Van Brandis, Johannesburg, S. A.

COMPLETE KIT  
FOR ENTIRE MODEL

\$6.00  
Without Motor

Ask Your Dealer or  
Order Direct Postpaid



# Quality 24 Hour Quantity Service

## 18" Balsa

1/16x1/16, 100, 5c  
1/16x1/8, 35 for 5c  
1/16x3/16, 18, 5c  
1/16x1/4, 15 for 5c  
1/16x1/2, 5 for 5c  
3/32x3/32, 30, 5c  
3/32x1/8, 12 for 5c  
3/32x1/4, 10 for 5c  
3/16x3/16, 8, 5c  
3/16x1/8, 6 for 5c  
3/16x1/4, 5 for 5c  
3/16x1/2, 3 for 5c  
1/32x2, 8 for 10c  
1/32x2, 8 for 10c  
3/32x2, 7 for 10c  
3/16x2, 6 for 10c  
3/16x2, 3 for 9c  
3/16x2, 3 for 10c  
2 sheets or 36" lengths, double above prices; add 10c packing charge for 36" lengths.

## 12" Sheets

1/16x2, 12 for 10c  
3/32x2, 9 for 10c  
3/16x2, 8 for 10c

## 24" Sheets

1/16x2, 12 for 10c  
3/32x2, 9 for 10c  
3/16x2, 8 for 10c

## 18" PLANKS

1x1, 5c; 1/2x2, 6c  
1x1 1/2, 9c; 1x2, 10c  
1x2 1/2, 15c; 2x2, 18c  
2x3, 23c; 2x6, 39c  
3x3, 40c; 3x6, 75c

## TISSUE, ALL

All col., doz., 19c  
Silver, wh., 19c  
Superfine, wh., 19c

## WHEELS per pr.

Bush Bina Cells  
1/4, .01, .03  
1/8, .02, .04  
1/16, .03, .05  
1/32, .04, .08  
1/64, .07, .10  
1/128, .10, .15  
1/256, .15, .30

## PINE WHEELS, pr.

Both sides alike  
3/4, 4c; 1/2, 5c  
1/4, 8c; 1/8, 10c

## NOSE BLOCKS

1x2x1, 1c  
2x2x1, 1c  
2x2x2, 1c  
3x3x1, 1c  
3x3x2, 1c  
3x3x3, 1c

## INSIGNIA

24 and stripes 5c  
WASHERS  
1 doz. 1/4 or 1/2 1c

## THRUST BEARINGS

Small, doz., 10c  
Large, doz., 15c

## RUBBER

045, 25 ft. 5c  
1/16 sq., 20 ft. 5c  
1/4 sq., 15 ft. 5c  
3/16 sq., 10 ft. 5c  
3/16 sq., 10 ft. 5c

## LUBRICANT

Large bottle, 10c

## REED

1/32-1/16 2 for 1c  
3/32-1/8 1 ft. 1c

## SPECIAL RADIO OFFER

### IMPERIAL EASY-TO-BUILD RADIO KIT

All parts mounted ready to wire up and plug in. Complete (less tubes) with necessary fittings, supplies, simple directions, and knock-down cabinet. The thrill of a life-time—so easy even a child can assemble this new type 5 tube radio. Operates on A.C. or D.C. 115 volts. Your individual radio at a fraction of what you'd have to pay at any store.

Dealers: Send for Wholesale Price List

### IMPERIAL MODEL AERO SUPPLY

416M McDONALD AVENUE BROOKLYN, N. Y.

# HEADQUARTERS FOR GAS MODEL SUPPLIES

Send 3c postage for catalog

With all orders for \$1.00 or over of supplies only—your choice of one supply or three FREE OF CHARGE. Order at least \$1.00 of supplies only to get free offer.

1. Large bottle clear cement and 100 1/16 x 1/16 x 10 balsa
2. 50 ft. 1/4 flat rubber
3. 3 sheets silver tissue
4. Membership Pin in IMPERIAL MODEL CLUB.

Free postage on all orders in U.S. for 75c or over. Under 75c, add 10c. On all orders west of Miss. add 10c extra. Canada, U.S. possessions, and foreign, over \$1.00 add 15c. Foreign, under \$1.00, add 15c. No C.O.D. No stamps. Send 2c postage for Catalog

## PROPELLER BLOCKS

1/4 x 1/4 x 5 8-5c  
1/4 x 1/4 x 6 6-5c  
1/4 x 1/4 x 7 7-5c  
1/4 x 1/4 x 8 8-5c  
1/4 x 1/4 x 10 10-5c  
1/4 x 1/4 x 12 12-5c  
1/4 x 1/4 x 14 14-5c  
1/4 x 1/4 x 16 16-5c  
1/4 x 1/4 x 18 18-5c  
1/4 x 1/4 x 20 20-5c  
1/4 x 1/4 x 22 22-5c  
1/4 x 1/4 x 24 24-5c  
1/4 x 1/4 x 26 26-5c  
1/4 x 1/4 x 28 28-5c  
1/4 x 1/4 x 30 30-5c  
1/4 x 1/4 x 32 32-5c  
1/4 x 1/4 x 34 34-5c  
1/4 x 1/4 x 36 36-5c  
1/4 x 1/4 x 38 38-5c  
1/4 x 1/4 x 40 40-5c  
1/4 x 1/4 x 42 42-5c  
1/4 x 1/4 x 44 44-5c  
1/4 x 1/4 x 46 46-5c  
1/4 x 1/4 x 48 48-5c  
1/4 x 1/4 x 50 50-5c  
1/4 x 1/4 x 52 52-5c  
1/4 x 1/4 x 54 54-5c  
1/4 x 1/4 x 56 56-5c  
1/4 x 1/4 x 58 58-5c  
1/4 x 1/4 x 60 60-5c  
1/4 x 1/4 x 62 62-5c  
1/4 x 1/4 x 64 64-5c  
1/4 x 1/4 x 66 66-5c  
1/4 x 1/4 x 68 68-5c  
1/4 x 1/4 x 70 70-5c  
1/4 x 1/4 x 72 72-5c  
1/4 x 1/4 x 74 74-5c  
1/4 x 1/4 x 76 76-5c  
1/4 x 1/4 x 78 78-5c  
1/4 x 1/4 x 80 80-5c  
1/4 x 1/4 x 82 82-5c  
1/4 x 1/4 x 84 84-5c  
1/4 x 1/4 x 86 86-5c  
1/4 x 1/4 x 88 88-5c  
1/4 x 1/4 x 90 90-5c  
1/4 x 1/4 x 92 92-5c  
1/4 x 1/4 x 94 94-5c  
1/4 x 1/4 x 96 96-5c  
1/4 x 1/4 x 98 98-5c  
1/4 x 1/4 x 100 100-5c

## CAMEL'S HAIR BRUSHES

Small 3c; large 5c; extra large 8c

## NOSE PLUGS

1/4 x 1/4 x 1/2 12 for 8c  
1/4 x 1/4 x 1/2 12 for 8c

## DUMMY RAD. ENGINE (Cell.)

1 1/2" x 1 1/2" x 1 1/2" 25c  
2 1/2" x 2 1/2" x 2 1/2" 35c  
3 1/2" x 3 1/2" x 3 1/2" 45c  
4 1/2" x 4 1/2" x 4 1/2" 55c  
5 1/2" x 5 1/2" x 5 1/2" 65c  
6 1/2" x 6 1/2" x 6 1/2" 75c  
7 1/2" x 7 1/2" x 7 1/2" 85c  
8 1/2" x 8 1/2" x 8 1/2" 95c  
9 1/2" x 9 1/2" x 9 1/2" 105c  
10 1/2" x 10 1/2" x 10 1/2" 115c  
11 1/2" x 11 1/2" x 11 1/2" 125c  
12 1/2" x 12 1/2" x 12 1/2" 135c  
13 1/2" x 13 1/2" x 13 1/2" 145c  
14 1/2" x 14 1/2" x 14 1/2" 155c  
15 1/2" x 15 1/2" x 15 1/2" 165c  
16 1/2" x 16 1/2" x 16 1/2" 175c  
17 1/2" x 17 1/2" x 17 1/2" 185c  
18 1/2" x 18 1/2" x 18 1/2" 195c  
19 1/2" x 19 1/2" x 19 1/2" 205c  
20 1/2" x 20 1/2" x 20 1/2" 215c  
21 1/2" x 21 1/2" x 21 1/2" 225c  
22 1/2" x 22 1/2" x 22 1/2" 235c  
23 1/2" x 23 1/2" x 23 1/2" 245c  
24 1/2" x 24 1/2" x 24 1/2" 255c  
25 1/2" x 25 1/2" x 25 1/2" 265c  
26 1/2" x 26 1/2" x 26 1/2" 275c  
27 1/2" x 27 1/2" x 27 1/2" 285c  
28 1/2" x 28 1/2" x 28 1/2" 295c  
29 1/2" x 29 1/2" x 29 1/2" 305c  
30 1/2" x 30 1/2" x 30 1/2" 315c  
31 1/2" x 31 1/2" x 31 1/2" 325c  
32 1/2" x 32 1/2" x 32 1/2" 335c  
33 1/2" x 33 1/2" x 33 1/2" 345c  
34 1/2" x 34 1/2" x 34 1/2" 355c  
35 1/2" x 35 1/2" x 35 1/2" 365c  
36 1/2" x 36 1/2" x 36 1/2" 375c  
37 1/2" x 37 1/2" x 37 1/2" 385c  
38 1/2" x 38 1/2" x 38 1/2" 395c  
39 1/2" x 39 1/2" x 39 1/2" 405c  
40 1/2" x 40 1/2" x 40 1/2" 415c  
41 1/2" x 41 1/2" x 41 1/2" 425c  
42 1/2" x 42 1/2" x 42 1/2" 435c  
43 1/2" x 43 1/2" x 43 1/2" 445c  
44 1/2" x 44 1/2" x 44 1/2" 455c  
45 1/2" x 45 1/2" x 45 1/2" 465c  
46 1/2" x 46 1/2" x 46 1/2" 475c  
47 1/2" x 47 1/2" x 47 1/2" 485c  
48 1/2" x 48 1/2" x 48 1/2" 495c  
49 1/2" x 49 1/2" x 49 1/2" 505c  
50 1/2" x 50 1/2" x 50 1/2" 515c  
51 1/2" x 51 1/2" x 51 1/2" 525c  
52 1/2" x 52 1/2" x 52 1/2" 535c  
53 1/2" x 53 1/2" x 53 1/2" 545c  
54 1/2" x 54 1/2" x 54 1/2" 555c  
55 1/2" x 55 1/2" x 55 1/2" 565c  
56 1/2" x 56 1/2" x 56 1/2" 575c  
57 1/2" x 57 1/2" x 57 1/2" 585c  
58 1/2" x 58 1/2" x 58 1/2" 595c  
59 1/2" x 59 1/2" x 59 1/2" 605c  
60 1/2" x 60 1/2" x 60 1/2" 615c  
61 1/2" x 61 1/2" x 61 1/2" 625c  
62 1/2" x 62 1/2" x 62 1/2" 635c  
63 1/2" x 63 1/2" x 63 1/2" 645c  
64 1/2" x 64 1/2" x 64 1/2" 655c  
65 1/2" x 65 1/2" x 65 1/2" 665c  
66 1/2" x 66 1/2" x 66 1/2" 675c  
67 1/2" x 67 1/2" x 67 1/2" 685c  
68 1/2" x 68 1/2" x 68 1/2" 695c  
69 1/2" x 69 1/2" x 69 1/2" 705c  
70 1/2" x 70 1/2" x 70 1/2" 715c  
71 1/2" x 71 1/2" x 71 1/2" 725c  
72 1/2" x 72 1/2" x 72 1/2" 735c  
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74 1/2" x 74 1/2" x 74 1/2" 755c  
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76 1/2" x 76 1/2" x 76 1/2" 775c  
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99 1/2" x 99 1/2" x 99 1/2" 1005c  
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107 1/2" x 107 1/2" x 107 1/2" 1085c  
108 1/2" x 108 1/2" x 108 1/2" 1095c  
109 1/2" x 109 1/2" x 109 1/2" 1105c  
110 1/2" x 110 1/2" x 110 1/2" 1115c  
111 1/2" x 111 1/2" x 111 1/2" 1125c  
112 1/2" x 112 1/2" x 112 1/2" 1135c  
113 1/2" x 113 1/2" x 113 1/2" 1145c  
114 1/2" x 114 1/2" x 114 1/2" 1155c  
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117 1/2" x 117 1/2" x 117 1/2" 1185c  
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119 1/2" x 119 1/2" x 119 1/2" 1205c  
120 1/2" x 120 1/2" x 120 1/2" 1215c  
121 1/2" x 121 1/2" x 121 1/2" 1225c  
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145 1/2" x 145 1/2" x 145 1/2" 1465c  
146 1/2" x 146 1/2" x 146 1/2" 1475c  
147 1/2" x 147 1/2" x 147 1/2" 1485c  
148 1/2" x 148 1/2" x 148 1/2" 1495c  
149 1/2" x 149 1/2" x 149 1/2" 1505c  
150 1/2" x 150 1/2" x 150 1/2" 1515c  
151 1/2" x 151 1/2" x 151 1/2" 1525c  
152 1/2" x 152 1/2" x 152 1/2" 1535c  
153 1/2" x 153 1/2" x 153 1/2" 1545c  
154 1/2" x 154 1/2" x 154 1/2" 1555c  
155 1/2" x 155 1/2" x 155 1/2" 1565c  
156 1/2" x 156 1/2" x 156 1/2" 1575c  
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182 1/2" x 182 1/2" x 182 1/2" 1835c  
183 1/2" x 183 1/2" x 183 1/2" 1845c  
184 1/2" x 184 1/2" x 184 1/2" 1855c  
185 1/2" x 185 1/2" x 185 1/2" 1865c  
186 1/2" x 186 1/2" x 186 1/2" 1875c  
187 1/2" x 187 1/2" x 187 1/2" 1885c  
188 1/2" x 188 1/2" x 188 1/2" 1895c  
189 1/2" x 189 1/2" x 189 1/2" 1905c  
190 1/2" x 190 1/2" x 190 1/2" 1915c  
191 1/2" x 191 1/2" x 191 1/2" 1925c  
192 1/2" x 192 1/2" x 192 1/2" 1935c  
193 1/2" x 193 1/2" x 193 1/2" 1945c  
194 1/2" x 194 1/2" x 194 1/2" 1955c  
195 1/2" x 195 1/2" x 195 1/2" 1965c  
196 1/2" x 196 1/2" x 196 1/2" 1975c  
197 1/2" x 197 1/2" x 197 1/2" 1985c  
198 1/2" x 198 1/2" x 198 1/2" 1995c  
199 1/2" x 199 1/2" x 199 1/2" 2005c  
200 1/2" x 200 1/2" x 200 1/2" 2015c  
201 1/2" x 201 1/2" x 201 1/2" 2025c  
202 1/2" x 202 1/2" x 202 1/2" 2035c  
203 1/2" x 203 1/2" x 203 1/2" 2045c  
204 1/2" x 204 1/2" x 204 1/2" 2055c  
205 1/2" x 205 1/2" x 205 1/2" 2065c  
206 1/2" x 206 1/2" x 206 1/2" 2075c  
207 1/2" x 207 1/2" x 207 1/2" 2085c  
208 1/2" x 208 1/2" x 208 1/2" 2095c  
209 1/2" x 209 1/2" x 209 1/2" 2105c  
210 1/2" x 210 1/2" x 210 1/2" 2115c  
211 1/2" x 211 1/2" x 211 1/2" 2125c  
212 1/2" x 212 1/2" x 212 1/2" 2135c  
213 1/2" x 213 1/2" x 213 1/2" 2145c  
214 1/2" x 214 1/2" x 214 1/2" 2155c  
215 1/2" x 215 1/2" x 215 1/2" 2165c  
216 1/2" x 216 1/2" x 216 1/2" 2175c  
217 1/2" x 217 1/2" x 217 1/2" 2185c  
218 1/2" x 218 1/2" x 218 1/2" 2195c  
219 1/2" x 219 1/2" x 219 1/2" 2205c  
220 1/2" x 220 1/2" x 220 1/2" 2215c  
221 1/2" x 221 1/2" x 221 1/2" 2225c  
222 1/2" x 222 1/2" x 222 1/2" 2235c  
223 1/2" x 223 1/2" x 223 1/2" 2245c  
224 1/2" x 224 1/2" x 224 1/2" 2255c  
225 1/2" x 225 1/2" x 225 1/2" 2265c  
226 1/2" x 226 1/2" x 226 1/2" 2275c  
227 1/2" x 227 1/2" x 227 1/2" 2285c  
228 1/2" x 228 1/2" x 228 1/2" 2295c  
229 1/2" x 229 1/2" x 229 1/2" 2305c  
230 1/2" x 230 1/2" x 230 1/2" 2315c  
231 1/2" x 231 1/2" x 231 1/2" 2325c  
232 1/2" x 232 1/2" x 232 1/2" 2335c  
233 1/2" x 233 1/2" x 233 1/2" 2345c  
234 1/2" x 234 1/2" x 234 1/2" 2355c  
235 1/2" x 235 1/2" x 235 1/2" 2365c  
236 1/2" x 236 1/2



cessful in flying outdoor models in recent years.

All of our models are doped with the colors that we believe can be seen for the longest time.

On nearly all my models the supporting surfaces are colored red, with the fuselage and other parts colored an orange or green. In some instances I have colored the entire model red because this color seems to show up better than other colors at high altitudes. This reminds me of a flight which I witnessed last summer which proved in my opinion that red is one of the best colors if not the best to use in coloring a model.

Robert Huddleston of Indianapolis, while flying in the Scripps Howard Transcontinental Air Derby, on one of his flights managed to make an excellent flight, which if it had been under N.A.A. supervision would have been a world's record.

The flight was made on a hot summer day in June with practically no wind and but few clouds.

Shortly after the beginning of the flight, the model began to hit some thermals, and in a short while was up to an altitude of approximately two thousand feet. After following the model by car to the boundaries of the field from which there were no roads leading in the direction the model was taking, we followed it on foot, having no difficulty in keeping up with it and walking directly under it. Due to the color of the model which was a dark red and which appeared to be a red dot in the sky, not much trouble was experienced in keeping sight of it till it drifted directly beneath a cloud and the currents sucked it up into it.

After the plane had disappeared in the cloud, it was decided to follow the cloud till the model came out or the cloud broke up. After a short time the cloud broke up and we soon located the model, now beginning to lose altitude, and in approximately seven minutes the model came gliding to the ground, close enough to us so that we could have caught it if we cared to.

The model had been in the air for thirty-nine and one-half minutes and the entire flight had only covered one and one-half miles.

The plane was a tractor model and a replica of the model that I won the Mulvihill Contest with in Akron in 1934.

After getting back to the field, we inquired of the meteorologist at the airport at what altitude the clouds were, and he told us they were at an altitude of thirty-five hundred feet.

Some model builders may disbelieve that a small rubber powered model can be seen at such high altitudes, but as long as the models do not get too far away from the timers horizontally, they can be seen considerable distances vertically. Of course the only days that they can be followed so closely are such as the one I just described. On other days when a moderate wind is blowing and large cumulous clouds fill the sky, it is a difficult task to keep very close to a model, chiefly because the roads or highways don't usually go the same way

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7½ ft. Wing-Span

Stressed for TWO Horsepower. Wing Chord 14". Overall length 59". Weight, Ready-to-fly with Brown Junior Power Plant, 5½ lbs. Recommended Power 1/6 to 1/3 h.p.

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that the model goes, and when zigzagging all over the country in an effort to find a road going the right direction, the model is invariably lost.

Another thing which helps a builder to retain sight of his model is the free-wheeling propeller, which when doped with several coats of banana oil and sanded with fine sandpaper, gives a smooth finish and causes a reflection when the sun strikes the blades at certain angles, thereby making it easier to be seen.

In preparing for a national contest it is advisable to build an extra model or two if the rules allow in case an unforeseen catastrophe eliminates one.

An accident like this happened to me at

**COMPLETE KIT**—Including EVERYTHING to build the model except power plant and wheels. Kit includes:—Ribs and bulkheads printed on wood, all wood specially selected and accurately cut; pint cans of cement and colored dope; tubes of cement for covering; wire for landing gear; wood for motor mount and battery box; toggle switch; aircraft ignition cable; bamboo paper; full size plans and instructions.

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the National Contest in St. Louis when the lid of the box my models were packed in was blown shut and crushed one of them.

After the models are built, test fly them, not in the morning or afternoon when there is sure to be risers, but just before or after sunset. This not only eliminates the possibility of the model getting in a riser and becoming lost, but will also help in giving the model the correct adjustments. If the model is test flown when there are currents, the performance of the model when it hits one or two currents may lead one to believe that it is adjusted correctly, but in all probability the adjustment is far from perfect, which may not be discovered

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Freshly packed in attractive bottles, tubes and cans to speed sales. Order now. 24 hour service.

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1 oz. Bils. or tubes, per gross.....	\$4.00
3 oz. Cans, 3 Dozen.....	\$2.75
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until the model is entered and flown in a contest where it may work in an altogether different manner.

When a model comes down not completely unwound, it is advisable to add two strands of rubber which will greatly increase the climbing angle and altitude, besides increasing the duration and the chances of hitting a rising air current. Many builders have their models underpowered, reasoning perhaps, that the less amount of rubber used, would mean more winds, and the more winds the more duration.

At the National Contests in St. Louis there was almost a wholesale change of this method, and as a result the records were greatly increased.

## Aviation Advisory Board

**Question:** What is the directional center of a plane?

**Answer:** The directional center is the center of lateral area.

**Question:** What is the spiral center and how can it be found?

**Answer:** The spiral center of an airplane is not a standard phrase. Undoubtedly this has been coined by some model builder and we are in doubt as to what the originator of it refers to.

**Question:** Explain the advantages of an airfoil, the lower section of which is concave.

**Answer:** Such an airfoil is most suitable for a slow, weight carrying airplane. When the lower surface of the airfoil is concave the airfoil gives greater lift than when it is flat or convex. Such an airfoil carries a greater load but at a slower speed than airfoils which are convex.

**Question:** What are the principal calculations needed for a gas model?

**Answer:** The principal calculations are, all of the calculations. One is just as important as another, if calculations are to be made at all. Inasmuch as these are very lengthy and involved it is impossible to give them here. A detailed explanation to follow in designing a gas model will appear in a few months in the magazine under the title, "How to Design Your Gas Model," by Charles Hampson Grant.

## Model Builders Hall of Fame

(Continued from page 13)

bon in a Baby R.O.G. event. His prizes have now reached a total of about fifty-five, with ribbons being conspicuously absent.

His early ambition was to some day attend, and maybe win, a national contest. To say that this goal has been achieved is to put it mildly. Perhaps "quadrupled" would be more in the way of keeping with the adjectives that are designed to explain his career. In 1933 he entered the New York City National Meet. The outdoor events at that time specified their respective rules but no provision was set down for the motive power. In other words, as long as the propellers turned around, the officials weren't particularly interested in the little matter of what made them turn. Aside from one or two more violent (than rubber) forms of propulsion, no attention was paid to this aspect. Since gas engines were not considered, shall we say, violent, Bassett was allowed to enter his gas models in competition with the rubber models. This was not considered a threat by the other contestants, however. With a shrug of the shoulders it was dismissed as merely a novelty gesture. So Bassett merely won the Texaco, Mulvihill, Stout and Moffett trophies as a result of the "mere" novelty!

And then the fun began. Gas models were immediately put into a separate class. The town and country suddenly awakened to this new sport which has long since grown to large proportions but a little common deduction will place the scene of the original inspiration at the outdoor flying events of the 1932 National meet—and that's where Bassett came in.

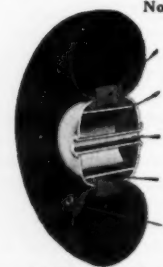
His most unfortunate incident occurred at the St. Louis National Meet. He was quite rushed in the preparation for this meet, as is usually the case in all meets. In his haste, he purchased three dozen batteries for use at the contest. On the morning of the event, he followed the usual routine of checking the gas model but did not check the engine, since everything appeared to be all right. About two o'clock he decided to take an official flight and started to warm up the engine. He ran it for a minute, the usual procedure, and it seemed to turn over very smoothly. He launched the ship, but after running for a minute and one half in the air, the engine suddenly "conked". The plane glided, and as luck would have it, landed in the Mississippi river. With the aid of a boat (if Joe Kovel prefers to swim out to his model, that's all right with Bassett, but he prefers a boat!) the model was retrieved and brought back to the field for another official flight. The engine, however, continued to cut after one and one half minutes, and try as he would, it refused to run any longer. The remainder of the afternoon was devoted to this little matter of trying to keep the engine awake, but to no avail. As a result, he placed third in the contest. It was the only motor trouble Bassett had ever experienced and he was quite puzzled about it—until he remembered the batteries. He decided to try each one, and sure enough, they would not run the engine for more than one or two minutes a piece. The moral of the story, says Bassett, is not to place any degree of trust in batteries which have not been tested at their time of pur-

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Note Super-Construction of M & M 3½-4½ and 6" Wheels

5 Reasons Why These Wheels Are Popular the World Over



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Paid and Pat. Pend.

Special Designed Hub giving added protection on heavy landings.

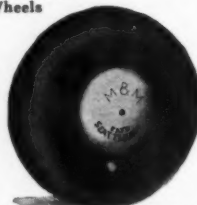
Aluminum Spreader giving added strength and cutting weight to minimum.

9/16" Axle Housing—note heavy roll on tube ends—also large bearing surface.

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chase. His three Brown engines, which have been in constant use over a period of years, have given perfect service and show little or no signs of actual wear.

After noting our own feelings during the routine of a contest, we wondered what Bassett's were like. As a rule, enthusiasm is at a fever pitch while tuning up the models. If the craft wins, then delirium usually follows. But unsuccessful entries, however, generally result in a very down-cast spirit. Some contestants express themselves more violently than others. At a gas contest last year one young man placed his gas model, with engine in it too, in front of the wheels of his car, and deliberately ran over it! That, of course, was super-expression. We could not get Bassett to admit to any similar excitement.

"When I entered a contest, I was usually quite tense, but lately I have overcome this." And then, as he thought more about it, "I usually lay awake the night before and plan just how I was going to take my plane off and go over every detail of its adjustment. Of course, needless to say, I always go to a contest with the desire to win. After a competition I always feel satisfied, for, if I have not placed, I have at least gained some new knowledge and experience."

Somehow, there is little else to say about a contestant's feelings in a meet where he has not placed. Bassett's last sentence, sheepishly, leaves us as meek as the proverbial lamb.

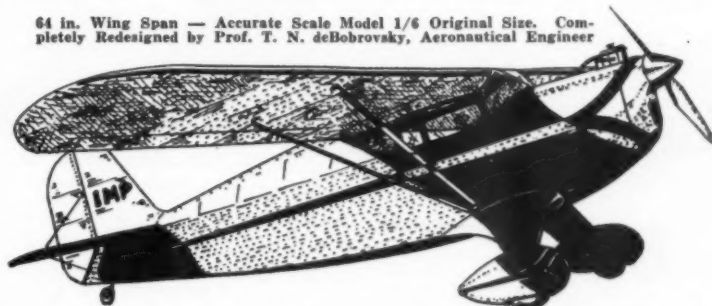
Up to the present time Bassett has invested between \$500 and \$1000 in his hobby. Excluding the price of the engine, it costs him from \$15 to \$20 to build a gas model. When we especially consider that his present activity is confined mostly to gas models, and that he has built twenty of them, the figure will not seem so high. When asked if the effort was worth the money put into it, the answer was enthusiastically affirmative. Aside from a cash prize which he received in 1935, there has been no monetary return, nor was any expected. Maxwell does not intend to make any money from models for he considers it purely a sport.

"I hope that model building in the future, will not become a financial proposition," was his statement. On the subject of radio-control, Maxwell feels that it is undoubtedly a practical thing for models. However, he opines, it is going to be limited to a very few, and that it will be quite a technical and complicated thing to operate. He sees no real reason at present to devote much effort to this endeavor because we already have it on large planes. It cannot in any way aid the development of the larger craft. Self-timers apparently do not receive his whole-hearted approval either. Of this he says,

"To be honest, self-timers seem to be one of the poorer solutions to the problem of judging who will be the winner. It would be much the same as towing a glider up to a certain height and then seeing which one could soar the longest. The best solution in my mind is to have a pay-load contest, or restrict the ship to some definite wing-loading. With the self-timers it would be a contest to see who could get the most powerful motor so as to have his plane highest in the allotted engine time."

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### Your Duration Model Power Plant

(Continued from page 27)

less. It merely means that more strands of rubber will have to be used in the motor to create the same rate of climb. At the same time the propeller will turn for a longer period of time.

On the other hand if an excessively high pitch is used a large amount of torque effect will be produced while the model is getting under way at the take off from the ground.

A pitch which will satisfy all conditions is one equal to one and one-half times the propeller diameter. In the case of the large size propeller, therefore, the pitch should be (1.5 x 18) or 27 inches. The smaller pro-



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propeller should have a pitch of (1.5 x 16) or 24 inches.

#### Propeller Area

The next problem that faces the model designer is the determination of the correct amount of area to be given to the propeller blades. The area should be sufficient to cause the propeller to create a thrust equal to the drag of the model on the propeller that exists when it is climbing at the desired rate. The thrust of a propeller of any given type, shape, pitch and diameter turning at a given number of revolutions per minute, is proportional to the amount of blade area used.

In preceding articles by the author, dealing with propeller design, it was shown that a propeller with a pitch of (1.5) times the diameter will require a blade area which is equal to 10% of the wing area, for a medium low rate of climb. If excessive power is applied to such a propeller, the plane will climb at a steeper angle but the propeller will not operate at its maximum efficiency as the slip of the blades will be such that they will not be passing through the air at the angle of maximum efficiency.

The duration model should be capable of a fairly steep angle of climb. Therefore the area of the propeller blades should be equal to more than 10% of the wing area. The propeller will act efficiently during a medium high angle of climb if the blades have an area equal to 15% of the wing area. This will be sufficient for the duration model.

The wing area of the model has been established as 200 square inches, therefore the propeller blade area should be 30 square inches. Now that this fact is known, from what size block is it to be cut in order that the blades will have the required amount of 30 square inches of area? This may be determined by means of the following formula, the solution of which has been given in detail in previous articles by the author. The formula is:

$$a_b = \frac{(\sqrt{d^2 + w^2}) + d}{2} (0.8) D.$$

The value for (d) in terms of (w) may be determined by means of the following formula:

$$d = \frac{Pw}{\pi D}$$

When the value of (d) has been found it should be inserted in the first formula in place of (f). When the (30) has been inserted in place of (A<sub>b</sub>) and the (18) in place of (D), the formula may be solved for (w), the width of the block from which the propeller is to be cut.

In the formula, (d) equals the depth of the block. (A<sub>b</sub>) equals the propeller blade area, and (D) equals the propeller diameter. The diameter value for the larger propeller is 18 inches. This should be used in solving the formula for the width, (w), of the large size propeller. The correct values for (d) and (w) as given by the solution of the formulas are, (d) = 1.26 inches (the depth of the block), and (w) = 2.65 inches (the width of the block).

The measurements of the block from which the propeller should be cut by the method in which diagonals are used, drawn from corner to corner, are diameter or length = 18 inches, width = 2.65 inches and depth = 1.26 inches.

When the 16 inch diameter propeller is to be used and the same angle of climb is desired as in the case of the plane equipped with the 18 inch diameter propeller, the blades should have the same area as the 18 inch prop, that is 30 square inches. This does not mean necessarily that the cross section dimensions of the block will be the same. The proper dimensions may be determined however by means of the same formulae. To solve them use the same procedure as in the case of the 18 inch diameter, 27 inch pitch propeller, but substitute the new values for the diameter and pitch in the formulae in place of (D) and (P). In this instance the diameter

(D) equals 16 inches and the pitch (P) equals 24 inches.

By solving the formulae you will find that the width of the block (w) should be (2.96) inches and the depth (d) should be (1.38) inches. It should be 16 inches long.

After the propeller for your plane has been cut out by following the diagonal guide lines drawn from corner to corner, the trailing edge of the propeller should be cut away at the hub. This cut away portion should taper from zero at a point 40% of the blade length from the center of the hub, to a maximum depth of about ½ inch at the hub. Cutting away the propeller at the hub in this manner does not reduce the effect of a given amount of blade area, so it may be ignored in the calculation of the correct amount of blade area to use. The corners of the blades should be cut away so that they are elliptical in shape.

It is possible that the two propellers outlined here may have more blade area than is required for the best results, though this is seldom a fault. This may be due to the fact that the formulae give the correct blade area for the average model, which usually is not as refined in streamline outline as the Wakefield superduration type of model. Such models are designed so that they produce less resistance than the average plane and therefore cause less drag on the propeller when in flight. Under these conditions the blade area required will be slightly less than specified here. Thus the blades may be cut away equally at the leading and trailing edges throughout their length. Before cutting away the blade the final form of the smaller blades should be outlined in pencil and the edges of the full size blades cut down the proper amount. In highly streamlined ships about 20% less blade area may be used than is specified here. It is advisable however if there is any question about the amount of blade area to use, that the blades are made oversize rather than too small. (Complete information relative to the design of the propeller has been given in previous articles published in MODEL AIRPLANE NEWS, June 1932 to November 1932 inclusive.)

#### Motor

Usually model designers determine the correct number of strands to use on their models by the "cut and try" method or should we say the "put and take" system. As a rule they make a wild guess as to the number of strands that will be required to fly their model. If they find that their guess is inaccurate they put on or take off some of the rubber as trial flights may dictate.

However this practice is not necessary to the extent with which it is carried on at present. A table showing the approximate number of strands to use on models of various weights with propellers of different diameter (the pitch-diameter ratio being 1.5 to 1.0) is given on page 27 of the October 1935 issue of MODEL AIRPLANE NEWS.

The values in the tables are for models equipped with double-surfaced wings. For a propeller with a diameter of 16 inches, 19.8 strands of (⅜" x 1/30") rubber is specified for a model weighing 4 ounces. As



the number of strands used is about proportional to the weight of the model it is very simple to calculate the number of strands required for the Moffett Contest model, equipped with a 16 inch propeller. The required number of strands will be  $(19.8 \times 6/4)$  or about 30 strands of rubber. Due to the fact that the model is a type which is highly streamlined and very efficient aerodynamically much less power will be required to fly it than other models. This is the advantage of a highly efficient plane. It is not unreasonable to assume that the amount of rubber required may be reduced by 20%. Thus six less strands may be used which leaves a total of 24 strands that should be put into the motor.

By means of the same system of calculation you may determine the number of strands required in the 8 ounce Wakefield Contest model using an 18 inch diameter propeller. According to the table about 22 strands will be required to fly a 4 ounce plane using an 18 inch propeller. Thus it is obvious that 44 strands should be used for an 8 ounce model with this size prop. As in the Moffett Contest model this number may be reduced about 20% due to the high efficiency of the plane. Thus instead of 44 strands about 35 strands of  $(1/30") \times (1/30")$  rubber may be used.

The exact number of strands to use on your models may be determined by means of a formula which follows. This formula takes into account every important aerodynamic characteristic of the model and therefore it is quite accurate. However if you have a distaste for mathematics or lack a fair amount of patience it is suggested that you use the table previously mentioned as a basis of calculation. The formula is:

$$N = 3.84 \left( \frac{40W}{A} \right) \text{ times}$$

$$\sqrt[3]{\frac{A}{12.5(a)} \left[ D(W+0.5) \left( \frac{d^3+w^3}{w^3} \right) 0.8 \right]}$$

In the formula: N = the required number of  $(1/30" \times 1/30")$  strands; W = the weight of the model in ounces; A = the wing area in sq. in.; D = the propeller diameter; d = the depth and (w) the width of the propeller block from which the propeller is cut by the diagonal method.

By substituting the values for the Wakefield Contest model in the formula, and solving it, you will find that it specifies that 55 strands should be used. However the formula as presented gives the required number of strands for models with single surface wings. The formula answer must be multiplied by (0.8) when double-surface wings are used. The formula answer then will be, 44 strands required. This is the answer indicated by the table estimates. A further reduction of 20% for super-efficient models will give the number of strands required as 35.

The model builder may use his judgment as to the exact efficiency of his plane. He knows, however, that the strands required will be between 35 and 44 in number, depending upon how well he has designed and built his plane.

Next month the determination of the correct size of the tail surfaces and other final details of the design of your duration model will be discussed.

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## We Shall Not Scrap Our Gas Jobs!

(Continued from page 7)

viously a young man does not wish to fly his plane out of sight and lose a \$30 to \$100 model. It is to his advantage to restrain the flight of the model to a radius within his eyesight.

As far as any damage being done when striking people, we suggest that anyone who wishes to discourage this sport consider our national baseball game in which a ball may be knocked into the bleachers. Under such circumstances someone might be hit and unless they can catch the missile they probably will be unable to avoid it due to crowded conditions of the bleachers. On the other hand, a model is large enough for anyone to see when it is approaching so that they may avoid being hit by it. The chances of anyone being hurt in this sport is just 1 in 100,000. In fact, we believe that

a baseball game, such as we refer to, is a very much more dangerous operation, and yet baseball games have not lost their popularity nor have they been suppressed.

We wish to deny the second accusation, that is that gas must be kept in the house. Gasoline DOES NOT have to be kept in the house while operating gas models, in fact no engine need be run in the house. Gasoline may be kept in the garage or shop outside of the house, just as gas is kept for the automobile in these locations. Whether gasoline is kept in the house is entirely up to the wisdom of the parents of the boys or young men who run their engines. If a parent sees fit to let a young man run his engine with gasoline in the house, or if anyone wishes to do this on his own initiative, it is certainly not any model director's province to say whether he can or cannot do this. In other words, the wisdom of this is entirely up to the parents or to the person operating the engine. At least it is not necessary to do



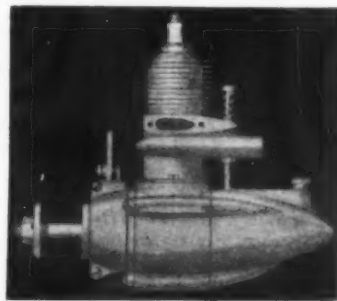
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James Weir, Bakersfield, Cal., says, "1 Tablespoon full of gas kept my Scout in the air 15 1/2 minutes."



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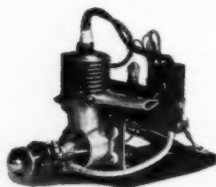
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this.

One cannot help but laugh at this accusation when they realize that thousands of tons of gasoline parade up and down the streets every day in automobiles. A final measure of this is that up to the present time no serious damage has ever resulted from the use of gasoline under these conditions.

The next consideration is the disregard for laws of personal property by gasoline model fliers. This is obviously untrue, inasmuch as most of the model builders have placed themselves under the guidance and restriction of responsible clubs and associations and are taking every step to not only make this sport popular and beneficial to those who participate, but safe for everyone concerned. If model fliers had a disregard for personal and property laws they would not join those organizations and subject themselves to their restrictions.

The next point is that they are a hazard to planes approaching or flying over airports where gas models may be operated. Provided that gas models were operated and in the air under these conditions, the one particular point in space at which a large plane may be located in space is so infinitesimal compared to the volume of air or space in which it may be flying that it is one chance in a million that a gas model would strike it, even if several were in the air at once. Considering them as a hazard to large planes also assumes that the pilot would be absolutely unaware of the model's existence and approach. Usually however any pilot would see another

ship or a gas model so that he could avoid it. No gas model flies as fast as a big plane, therefore, it could not approach a large plane from the rear. It would therefore have to approach from the front and in full view of the pilot.

If we go on this same basis and carry matters far enough we should ban all birds from flying, inasmuch as birds are a hazard to large planes when they strike the propellers. However, restrictions have been placed on the flights of gas models so that they do not interfere with the flying of large planes, taking off from an airport, approaching it or flying over it.

Obviously a person who was determined to see the danger in such a procedure would have to use a magnifying glass. The whole argument is based on the fact that there is danger in this sport to those who participate in it and to anyone or anything which may be struck by a gas model. If there is a danger in this it is so infinitesimal when there is any supervision whatsoever concerning the flights of gas models that it is ridiculous to consider it seriously. After all, it is a question of the degree of danger involved. Model airplane building as a whole will suffer at the hands of those who attack it in part.

Upon reading this editorial will you not please write your comments to the head office of the International Gas Model Airplane Association, 551 Fifth Avenue, New York City, and donate any "ammunition" in the line of suggestions which may be used to fight the unwarranted restraint of gas models? Anything you can do will not only

help the cause but will benefit you and every other gas model builder in the country.

CHARLES H. GRANT,  
I.G.M.A.A. Director.

## Gas Lines

(Continued from page 20)

In the afternoon the Limited Fuel Event took place. 1/8 ounce of gas per pound of weight of the model was allowed. This ran off smoothly except for the fact that as many as ten models flew out of sight. This would indicate that 1/8 oz. of fuel per pound of weight is entirely too much fuel to use at contests. There are several young men who have talked against using a small amount of fuel. We call their attention to the results of this event so that they may change their ideas and not promote a cause which is going to be expensive as well as harmful to gas model fliers.

This event was won by Franklin Kral with a time of 20 minutes, 46 seconds, who received the S. S. Kresge perpetual trophy. This trophy was donated by the S. S. Kresge Company and was a beautiful gold-bronze cup of large size. This cup will be given every year to the winner of this event at a contest sponsored by the Kresge Company. Model contestants owe their appreciation to Messrs. Charles Hart, John Bartholomew and Benjamin Shershaw for contributions made by this concern. Second prize was won by Ben Haydon of 130 Robeson Street, Reading, Pa., with a time of 20 minutes. He received a Baby Cyclone engine and propeller given through the courtesy of Aircraft Industries. Major C. C. Mosley was directly responsible for this contribution. Third place went to Maxwell Bassett of 11th Street & 66 Avenue, Philadelphia, Pa., with a time of 19 minutes, 3 1/2 seconds. He won a \$10 voucher donated by the Berkeley Model Supplies company. Fourth prize, a Scientific gas model kit of the "Miss Philadelphia," Maxwell Bassett's record plane, was awarded to Frank Ehling, for a flight of 18 minutes, 33 1/2 seconds. This prize was donated by the Scientific Model Airplane Company. Fifth through ninth places were awarded to:

Albert Mall of 290 Summitt Avenue, Jersey City, N.J., with a time of 13 minutes, 56 seconds; Martin Nemerofsky, 4920 North Franklin Street, Philadelphia, Pa., with a flight of 10 minutes, 31 1/2 seconds; Warren Leff, 27 Herrick Drive, Lawrence, N.Y., with a flight of 10 minutes, 58 seconds; Kurt Claus, 622 West 136 Street, New York City, with a flight of 12 minutes, 5 1/2 seconds; Richard Bloom, 658 Penn Street, Reading, Pa., with a time of 7 minutes, 56 1/2 seconds. They won subscriptions to MODEL AIRPLANE NEWS and gold medals respectively.

Readers will note with interest that the first four places were won with times of over 18 1/2 minutes; the longest being 20 minutes, 46 seconds. Difficulty was experienced in keeping the models in sight as a brisk breeze carried them far from the field. Though several models were lost, a number have been found since. One was Frank Ehling's model, which was found on Staten Island, several miles from the field. It is getting to be a regular thing for Frank to lose his model. Hardly a

Many contenders had hoped to win the IGMMA Trophy which Maxwell Bassett

The Philadelphia Gas Model Association held a meet on Sunday, June 6, at Main Line Airport, near Malvern, Pa. Thirteen contestants were entered and a number of others tested ships during the



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1x1 1/2x1 1/2	1 for .03
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day. The contest was under the direction of Jesse Bieberman, 3219 E. Brighton St., Philadelphia, Pa., who is director of the P.G.M.A. Any gas model builder who is interested in joining this organization should get in touch with Mr. Bieberman. The following are the results of the meet:

1. Martin Nemerofsky, age 17.....5m 45.2s
2. Ralph Senter, age 13.....3m 10.2s
3. Jack Schwartz, age 22.....2m 50s
4. John Fries, age 21.....2m 40s
5. Jesse Bieberman, age 32.....2m 30.2s

The ship of the first place winner was unusual in that it had a wing spread of twelve feet. On its winning flight, this ship landed in a dense forest on a steep hillside. A party of about twelve people searched for the ship for nearly three hours and finally located it after a Taylorcraft from the airport sighted the model from the air and circled over it until the ground party also saw the model. The ship was found to be in perfect condition.

## Yakima, Washington

Another major contest was held recently in Yakima, Washington. An account of it has been sent by Joseph F. Morris of R.F.D. No. 2, Box 26, Selah, Washington. Pictures of this meet will appear in the next issue. It is as follows:

Unit 57, Yakima chapter IGMMA held its first model meet Saturday, May 15, at the Yakima County, Washington airport. Twenty-seven gas-powered models, ranging in size from a small thirty-inch high wing design powered with a 1/20 horsepower Elf engine to a scale model of a Monocoupe DeLuxe of eight feet wing span carrying a one-quarter horsepower motor of original design, were entered in the meet.

Several kit-set Rearwins, Baby Cyclone powered, two stick models, two Corbin Super-Aces, Brown Jr. powered, numerous original designs and one revolutionary Stearman-Hammond "Y" powered with an inverted Brown Jr., were among the entries. Two original racing jobs, both in-

verted Cyclone powered, came to grief. One, built by Claude Woodworth and winner of the appearance prize of the meet, caught fire and was totally destroyed. The other racer, a parasol built by Buster Whiston, got dust in its motor and refused to start. Both models were clean and aerodynamically sound and would, barring misfortune, probably both have placed.

Extremely dusty runways played havoc with the engines. Gordon Cerswell's Corbin Super-Ace, six foot wing span and Brown Jr. powered, got away before the timer had been set, cruising about above the delighted crowd of two thousand spectators in a flight of 7 minutes and 45 seconds. Because it was untimed it was not considered in the judging, but it afforded rare entertainment for the crowd. Cerswell later got an official timed flight of two minutes and four seconds, to win the grand prize of a flying course up to and including solo, offered by Western Airlines, Inc.

For spectacular flights, Carl Van Court's "Toots," a high wing design powered with the Elf of 1/20 horsepower, gave the spectators something to cheer. This little ship, smallest entered in the meet, took off at an angle of forty-five degrees and climbed steadily at that angle, finally flattening out and flying in great circles to come down to a perfect landing each of its three flights. The stabilizer of this little plane is set at a negative angle of incidence relative to the longitudinal axis and the line of thrust is eight and one-half degrees negative relative to the longitudinal axis. Such a setting gives a steep, non-stalling takeoff under power and a flat, normal glide deadstick. When the judges objected to the angle of takeoff, Van Court changed the stabilizer setting and gave a normal takeoff and a spot landing directly in front of the judges, to quality for first place in landing and second in duration.

Charles Lamb with a Chieftain of six foot wing span made a flight of 1 minute 9 seconds to take first in takeoff and landing events.

An interesting ship at the meet was Roscoe McLeran's Stearman-Hammond "Y." It attracted much attention, being the only pusher entered in the meet. It did not fly, due, officials believe, to the wing having too little angle of incidence. Re-designed, it should be a very stable ship. It is powered by an inverted Brown Jr.

Judges were Steve Stussy of Western Airlines, Inc., Gene Schultz, and Charles McAllister of McAllister Flying Service. Timers were Clarence Ernst, secretary of the Yakima YMCA, Clarence Monson and B. E. Nelson.

Results of the meet were as follows:

### Grand Prize

Gordon Cerswell {Flying Lessons  
up to and  
including solo

### Appearance

Claude Woodworth {Cleveland Rearwin  
George McLaughlin {kit; 30 minute  
aeroplane flight

### Take-Off

Charles Lamb {Cleveland Rearwin  
Carl Van Court {kit; Modelcraft  
Flying battery

## Flight Characteristics

Charles Lamb {Cleveland Stinson  
kit; AC Baby Cy-  
clone spark plug

## Endurance

Carl Van Court {Brown Jr. Motor;  
Charles Lamb {1 pair 3½" M and  
M Airwheels

## Landing

Carl Van Court {Cleveland Stinson  
Charles Lamb {kit; Modelcraft  
Flying battery

## Bayonne, New Jersey

Mr. Arthur Kennedy, corresponding secretary of the Jersey Mosquitoes chapter of the N.A.A., of 10 East 32nd Street, Bayonne, New Jersey, sends us some information about this club. It is:

There has been much activity in the gas field by members of the chapter. There are altogether about 12 jobs in the club, nearly all of which take part in the frequent gas contests. Two of our members did outstanding time at the last IGMMA contest held at Hadley. They are: Frank Ehling of Jersey City with his own design which did 18 minutes until it flew out of sight, and was later found in Staten Island and Albert Mall of Jersey City with an Ehling-designed ship which did 16 minutes and also flew out of sight and was found in Plainfield.

## Columbus, Ohio

We hear from Bob File of 502 Seymour Avenue, Columbus, Ohio, a member of the Columbus unit of the IGMMA. He tells us that the contest which had been planned for July 25th and which was announced in the July issue, will be held on Sunday, July 18th, instead. All fans who intend to enter this contest should take particular note of this. The contest will be sanctioned by Mr. Robert Allen through the IGMMA in Pittsburgh.

## Jacksonville, Fla.

Mr. Owen Perdue, secretary of the Prop Twisters, Unit No. 46, of 547 West 28th Street, Jacksonville, Florida, writes and tells us of the contest which they held in April. The winner was Elmer Wasman, a unit member, whose time was 4 minutes, 48 seconds. His plane was an original mid-wing and powered with a Brown Junior engine. He used ⅓ ounce of fuel. He won a round trip to Mobile, Ala., via air, given through the courtesy of the Atlantic and Gulf Coast Airline of Savannah, Georgia.

## Notices

Raymond Landis of 242 West Godfrey Avenue, Philadelphia, Pa., one of the contestants at the IGMMA contest on May 22nd, writes and tells us that he lost his plane after an official flight of 10½ minutes. It landed in the wooded region of South Plainfield, N.J. Though a diligent search was made of the territory for several hours, they found no trace of this ship. It was a seven foot span "Quaker" model of blue and yellow. It had a Brown Junior motor, B-2723. The fuselage and rudder were blue with yellow scalloping and the wing and stabilizer were yellow with blue scalloping. It had identification on the center section of the wing and was I.G.M.-15-10-1.

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2. ALL STEEL CYLINDER machined from one piece to tolerance of .0001". Multiple, narrow cooling fins provide efficient cooling at all speeds.
3. PISTON electric furnace cast iron, shear-ground to .0001".
4. CONNECTING ROD, drop forged dural I-Beam.
5. WRIST PIN, full floating, tubular steel with pads to prevent cylinder scoring.
6. MOTOR SPEED—500—14,500 R.P.M. with flywheel.
7. CRANKSHAFT machined from solid stock. Fully counterbalanced with standard pin taper to take up play as shaft wears.
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9. TIMER adjustable spring steel with platinum point—an exclusive OHLSSON feature.
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Only Ohlsson Gives You All These Features Plus a Positive Guarantee Against Defective Parts and Workmanship

Special 12", 13", 14" Hard Wood Props, 30c each. (No Dealers)

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□ Rush me one factory assembled, tested and guaranteed OHLSSON

Radial Mounted Motor. I enclose money order for \$18.50.

□ Send me complete information about OHLSSON Motors, Wheels, Mounts and Equipment. I enclose 3c stamp.

NAME .....

ADDRESS .....

M-3

the appreciation of the builder and the IGMMA. Please notify this office, 551 Fifth Avenue, New York City, or Mr. Landis.

We hear from Franklin Kral, winner of the Limited Gas Event at the Eastern States Contests. He gives us some data concerning his plane which may be of interest to other builders:

"My gas-powered plane, which won the IGMMA meet at Hadley Field on May 22, was designed and built by myself in three weeks. The fuselage was 60" long, covered with ⅛" sheet balsa. The wing span was 7' and the wing was built in three sections; the center section being 3' long and each wing tip being 2' long. The wing tips were removable so that the model could be transported easily. Every gas model I have built (and I have built six of them), has had the wing built in two or three sections. The airfoil used on this last model that won the meet was the Clark Y, the chord being 12". The plane weighed 4 pounds and was powered with a Brown Jr. Motor, turning a 14" diameter propeller of 9" pitch. Incidentally, this Brown Motor was over two years old, and it had been in more than fifteen crackups without damaging it in any way. This motor had never needed any repairs whatsoever.

"This plane was lost on the winning flight and I would appreciate it if you would mention the loss of my plane and state that a reward is offered for the return of the Motor, Air Wheels and Timer only. The Motor Number is B-474."

We received a letter from Mr. Pete Dillon of West & St. Clair, Jackson, Michigan, who is leader of Unit No. 25. He says:

"The new rules that dealers cannot be members left us high and dry. Out of six members two are dealers in gas model supplies and kits."

We believe that Mr. Dillon misunderstands the rules. The rules state that dealers or employees of dealers cannot compete with amateurs for prizes in IGMMA contests. This does not prevent them from holding contests specifically for dealers or from giving exhibition flights at IGMMA contests. It merely prevents dealers from competing with their customers, which is a very bad policy in any business. The IGMMA needs the help and support of all dealers. It is assumed that they have a superior knowledge due to their position in the field and therefore we look to them to act as leaders in this great undertaking of educating American youth in aviation through the medium of gas model airplanes.

A rule has been established since the publication of the last rule, and after consideration of a number of leaders of the organization, it was decided that those employed by dealers may enter contests, provided they are not a member of the concern which employs them, nor an official, director or supervisor of the concern. Any person who is employed by more than one concern is considered a dealer. Obviously anyone who does work for merely one

## THE 1937 MODEL BROWN JR. MOTOR



\$21.50  
Postpaid in  
U. S. A.

For model planes. Length overall 5 1/4"

New, improved model, made with the same fine workmanship that has made this motor famous for reliability and for performance.

### NEW FEATURES

Improved precision construction, designed to give top performance—More compact. Requires less space—Improved gas tank may be cleaned easily—Skids may be removed without disturbing ignition wiring.

Shipped ready to run. See the 1937 model at your model airplane supply dealer's or write us for details.

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2545 N. Broad St., Philadelphia, Pa.



concern ranks as an employee of that concern. It is hoped that this will help to clarify the situation.

Mr. Philip Nicovich of 2742 Verbena Street, New Orleans, secretary of Unit No. 44, writes us that it was necessary to postpone the New Orleans Gas Model Contest until June 13th. Further news of this meet will be forthcoming.

Captain Frank Hawks, the well known speed flier, has honored the Association by accepting an honorary membership on the Board of Governors of the IGMMA.

News comes to us that the American made Baby Cyclone engines made a "sweep"

of the gas model events at the recent French Gas Model Contests.

We get word from Michael Fragasso of 211 West 108th Street, New York City, that he lost or had stolen a Brown Junior engine whose number is B-3412. If any one finds this engine or hears about it please notify Mr. Fragasso.

The following change regarding Unit No. 54 has just been received from Robert Schaefer. He says:

The name of our club has recently been changed from the Astoria Aeronauts (Unit 54) to the Stinson Putt-Putters sponsored by Mr. Jack B. Stinson, President of the Stinson School of Aviation. The Secretary of our club has also been changed; the new secretary is Robert Schaefer. If there are any members who wish to join our club please write or call in person at our club headquarters, Brewster Building, Queens Plaza, L.I.C., N.Y.

Please address all future communications to Robert Schaefer, care of Stinson, Brewster Building, L.I.C., N.Y.

### Colorado

The Denver Hi-Hat club, Unit 59, held a contest on April 24th. It got off to a good start about 11 o'clock, however, at about 1 o'clock a very strong wind sprung up and all the models were washed out. Unfortunately many builders did not have a chance to fly as they could not get off from work until 1 o'clock. Mr. Timblin, of Gano-Downs Company, who was directing the contest, wished to postpone it and award the prizes at a latter date when everyone had a chance to compete. However this did not appear to please several of the contestants who were leading at the time, so Mr. Timblin gave them their prizes.

It is unfortunate indeed that some model builders will not cooperate and show the spirit that the IGMMA is trying to promote among model builders. "Sportsmanship" should be the watchword among all IGMMA members and we look to each individual member to live up to the high standards set by this organization. Those who think more of prizes than of the human qualities of ability and sportsmanship which prizes are supposed to represent will not go far in aviation.

Mr. Robert VanBuskirk of 121 South

Alcott Avenue, Denver, Colorado, is secretary of this club.

### How an I.G.M.A.A. Contest May Be Held

Any authorized IGMMA unit or combination of units may hold a contest sanctioned by the IGMMA. The procedure they should take should be:

1. Write for a sanction and give a complete outline of how the contest is to be held, where the number of members expected to enter in the meet, prizes to be given and the director's name. It is well to have a sponsor for such a contest.

2. Such contests must be held under IGMMA rules, copies of which will be sent upon request.

3. The contest director should be an official contest director of the IGMMA. Directors may be appointed by requesting appointment of the IGMMA headquarters. Such applicants should list their qualifications for this appointment. Upon appointment "Official Contest Director" card will be sent to the applicant.

4. Timers at IGMMA contests must be IGMMA members and may be appointed as "Timers" by an official contest director of the IGMMA. Any member of the IGMMA with an official timer's card may act as timer at any contest.

5. In holding a contest, directors should make sure that all models conform to the rule which specifies that the cross section

of the fuselage should be equal to — 100

Also be sure no gas allowance is given to a contestant until the director is sure that the tank is entirely empty before the fuel allowance is put in.

6. Special care should be taken to disqualify the contestants who do not observe the rule of a free take off with "pushing" a model. Anyone pushing a model into the air should be disqualified. "Pushing" is clearly defined in the rules.

### Airways—Here and There

(Continued from page 40)

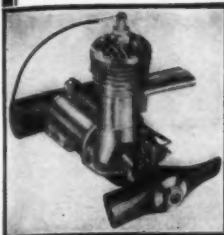
Automobiles equipped with radios operated on 5 meter bands followed fast flying models from the Practice Field on the afternoon of the 23rd. As it was, several

CHARACTERISTICS OF THE WORLD'S COMING SUPER AIRLINERS	MARTIN 4-ENGINE CLIPPER LAND TRANSPORT	MARTIN 156	SIKORSKY 5-44 FLYING BOAT	BOEING FLYING BOAT '314'	BOEING LAND TRANSPORT '307'	DOUGLAS DC-4 LAND TRANSPORT	DOUGLAS KLEIN-HANS	CURTISS LAND TRANSPORT	MARTIN PROPOSED FLYING BOAT	DORNIER DO-20 FLYING BOAT	LATECOERE 521 BOAT	FOKKER F-56	ARMSTRONG WHITSWORTH LAND TRANSPORT	SHORT EMPIRE FLYING BOAT	MAXIM GORKY TYPE
TOP SPEED		190		200		237	300		170	180		221	200	200	
CRUISING SPEED		160	200		250				155			191	160	165	
LANDING SPEED		70				68.5	150		72					73	
SPAN		157'	200'	152'	107'3"	136'3"	550'	140'	180'	161'	324'	126'3"	123'	114'	192'
LENGTH		90'7"	100'	109'		97'	375'	95'		131'		84'7"	110'	88'	
HEIGHT		24'9"		28'		24'4"	60'	16'		31'			23'	31'9"	
DAY CAPACITY	40	46	50	60-72	32	40	200	40				56	40	24	60
NIGHT CAPACITY	20	26		40	26										
GROSS WEIGHT		62,000	100,000	82,000	42,000	60,000	300,000	50,000	100,000	127,867			27-20	16	
PAYLOAD		9,400							45,194				40,000	40,500	7,200
NO. OF ENGINES	4	4	5	4	4	4		4		8	8	4	4	4	6
TOT HORSEPOWER		3,400	6,900	6,000	4,820	5,000			6,000	8,000	8,000		3,520	3,600	7,200
CARGO CAPACITY		1,380		5,000	3,750										
RANGE		3,800*				2,200	4,500		6,470	2,486		945	1,000	760	
CEILING	30,000		27,000		20,000	24,000		30,000	18,000					20,000	
CREW	5	7		8-9		5		4						5	8
TYPE															
POWER LOADING		18.2	14.5	13.7	8.74	12			16.6	16			11.3	11.3	
WING LOADING		27.1							25				76.3	27	
USEFUL LOAD		32,645				20,000			52,000			23			
WEIGHT EMPTY		29,357							48,000	65,036				24,000	
NO. OF RUDDERS	2	2		1	1	3				1		2	1		1
WING AREA		1680							4,000				2450	1500	

NOTE: SPEEDS ARE IN TERMS OF M.P.H. — WEIGHTS IN POUNDS — RANGE IN MILES — AREAS ARE IN TERMS OF SQUARE FEET  
\* RANGE OF MARTIN CLIPPER 156 IS NOT IN TERMS OF MILES BUT OF GALLONS OF GASOLINE



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TWO FREE PROPELLERS WITH EVERY ASSEMBLED MOTOR—HANDY  
MODELER'S KNIFE FREE WITH EVERY MOTOR KIT OR GAS MODEL KIT!

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and ready to mount in your ship. POSTPAID

(See April, May, June issues of M. A. N. for photo and further details.)

1937 Mighty Midget Motor	\$16.50
1937 Inverted Mighty Midget	17.25
1937 Gwin Aero—With Exhaust Stack, Finned Head	17.50
1937 Gwin Aero, Inverted	18.25
1937 Brown Jr. Motor	21.50
1937 Baby Cyclone Motor	17.25
1937 Olsson Motor	18.50

Remember!—You Get 2 Free Propellers With Every Motor!

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1937 Mighty Midget Motor Kit	\$9.85
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1937 Gwin Aero Motor Kit	11.35
1937 Gwin Aero Kit—Inverted	11.60

Remember—You Get a Handy Model-Makers' Knife Free With Every Motor Kit!

We Stock the Following Gas Model Kits for Immediate Delivery:

C-D Rearwin Speedster—44½" span—\$4.85 postpaid (with airwheels—\$6.10)	
C-D Stinson Reliant—82" span—\$8.50 postpaid (with airwheels—\$9.75)	
Lindberg Rearwin Speedster—6 ft. span—\$7.00 (plus 50c shipping)	
Lindberg Berliner Joyce—5 ft. span—\$6.75 (plus 50c shipping)	
Lindberg Silver Flyer—6 ft. span—\$5.00 (plus 35c shipping)	
Comet Curtiss Robin—6 ft. span—\$4.75 (plus 50c shipping)—with wheels—\$6.50 (plus 50c)	
Denny Jr.—6 ft. Span—Complete Kit—\$10.00 postpaid	



C-D Rearwin Speedster

## Here Are Real Money-Saving Specials!

C-D REARWIN KIT AND GWIN AERO MOTOR—only \$21.90 postpaid	
C-D STINSON KIT AND GWIN AERO MOTOR—only \$24.90 postpaid	
LINDBERG REARWIN KIT AND GWIN MOTOR—only \$23.75 postpaid	
LINDBERG BERLINER JOYCE KIT AND GWIN MOTOR—only \$21.90 postpaid	
LINDBERG SILVER FLYER KIT AND GWIN MOTOR—only \$21.90 postpaid	
COMET CURTISS ROBIN KIT AND GWIN MOTOR—only \$22.50 (with wheels)	
DENNY JR. AND GWIN AERO MOTOR—only \$25.00 postpaid	

ANY OF ABOVE WITH MIGHTY MIDGET MOTOR—\$1.00 less than with Gwin.

—Figure Your Savings!—Order Now!—

Send 3c stamp for catalogue of gas model kits, motors, supplies.  
CALIFORNIA BUYERS—PLEASE ADD SALES TAX.

JAY'S MODEL SHOP—7763 Melrose Ave. (Dept. M-12)—Los Angeles, Calif.

models disappeared over the outskirts of Boston.

On both Saturday and Sunday the spectacular event with its smoke screen, stunt, plane-towing-glider, parachute dropping, and plane-launching-plane-in-mid-air flights proved most exciting. Special cups were awarded winners of these events.

## Linden, New Jersey

Mr. Frank M. Krysiak, Club Advisor of the Linden Recreation Commission, gives us some idea of the activities of his club in New Jersey. He writes:

Outdoor flying activities of the L.M.A.C. are in full swing, with many outdoor rubber-powered and gas model meets being planned.

Semi-monthly club contests are being held, the first of which was held early in May. Richard Egels, 1936 City Champion, won the cabin event when his plane flew out of sight at 6 minutes 5 seconds. The model flew into the New Jersey Reformatory yard at Rahway, and was returned by officer Charles Kruger. Eugene Matrejek was second with 1:33, while Roy Messenger was third with 1:17. The weight rule of 1½ oz. for 50 sq. inches governed this contest.

Egels also placed third in the New York University meet with a flight of 1:32.

Experimenting with one blade props, Roy Messenger, club president, flew his one-blade prop-driver model successfully out of sight. This was rubber powered. There was no vibration and the prop duration did not seem to be cut down. It has better climb, and there seems to be an advantage to free wheeling since the wind resistance is less.

## Philadelphia, Pa.

Mr. Victor R. Fritz sends us some news of the "goings on" of his club:

At the Fourth Indoor P. M. A. A. meet held in the Armory, Broad and Diamond Streets, George Micott, 16 of the Flying Keystone Chapter, Allentown, Pa., broke

the class A Stick Model R.O.W. record with a flight time of 8:54.

At the Seashore Indoor meet, held in the Convention Hall, Atlantic City, on April 11, 1937, by the Atlantic City Chapter of the P. M. A. A., three National records were broken. William Newlan Hewson of the Golden Eagles Chapter, broke the Junior Class A Stick Model R.O.W. record with a flight time of 7:25. Walter Lees of the Caterpillar Chapter broke the Senior Class B Stick Model R.O.W. record with a flight of 12' 36 2/10". James Throckmorton, of the Atlantic City Chapter, broke the Open Class A R.O.W. record with a flight of 6:10.6.

For the first time since the Anthony J. Drexel Biddle cup was established in 1912, a miniature aircraft flier has recaptured the historic trophy.

Sixteen-year-old William Wert, model plane ace, accomplished that feat when his Class C tractor plane circled for 19 minutes, 48.4 seconds in a record-breaking flight at the city indoor championship meet of the Philadelphia Model Aeroplane Association in the Convention Hall, Philadelphia.

Other interesting highlights of the meet happened when Charles Heintz of the Caterpillar Chapter broke the Senior Class B R.O.W. record with a flight of 14:16.8 and was surpassed by his team-mate, Walter Lees, with a flight of 14:35.4.

A similar case also occurred in the Junior Tractor event when Herman Mitchell of the Northeast Chapter broke the Local Hand-launched Endurance Class B record with a flight of 16:14.3, only to be surpassed by his team-mate, David Call, with a flight of 16:41.2.

The entire meet was a huge success.

## Bayonne, N. J.

Arthur Kennedy, corresponding secretary of the Jersey Mosquitoes Chapter of the N.A.A., 10 East 32nd Street, Bayonne, New Jersey, sends us the following data about the progress of his club.

REMEMBER! Our \$1.00  
Subscription Offer Expires  
August 9th.Ignition Specialties  
FLIGHT  
TIMER\$3.00  
Postpaid

FLIGHT TIMER for controlling your time of flight from 0 to 60 seconds inclusive. Weight 2½ ounces. Used as ON-OFF switch also, with silver contacts. Rugged, Vibration-proof, Accurate. Easily mounted. A necessity for the finals. \$3.00

IGNITION CONDENSER made for airplanes especially. Flexible stranded connections. Tubular aluminum case. Slide bracket for mounting. 35c

TUNGSTEN POINTS for your breaker system. Diameter ¼ inch. Set consisting of one rivet type and one screw type with nuts size 3-48. 40c

STANDARD COIL used on the leading engines made today. \$2.50

BIG SHOT ignition coil made for larger ships, boat engines, etc. Suitable for high-compression engines with speeds up to 20,000 R.P.M. All lead wires fastened with approved terminals. Weight 5½ ounces. \$3.50



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**A-J-C Model Gas Engines.** Now available in Kit form only \$7.55. Assembled \$9.85. Weight—7 oz. Power—1/2. Piston Rings. 3¢ for information. A-J-C Motors, Ingleside, Illinois.

**GAS Motors—\$5.00 up.** Highest allowance for your old motor on new or used motors. Send Stamp. Carl A. K. Eldredge, Jr., Haddonfield, N. J.

**ATTENTION Model Builders.** Our free price list will please you. Write. Waterbury Model Builders Supply, 131 Cherry St. Waterbury, Conn.

**RUBBER Thread.** Hodgman Rubber Company, 261 Fifth Avenue, New York City. Chicago Office: 412 South Wells Street. Dealers and Manufacturers only.

**SAVE as much as \$5.00 on your gas motor.** 3¢ for price list. Art Kronfeld's Model Supply, Arlington, Mass.

**DEALERS, Clubs, Schools:** Send for low, complete wholesale list, including gas motors. Save money. Model Airplane Utility, 5507 New Utrecht Ave., Brooklyn, N. Y.

**MOTORS Checked and Adjusted \$1.00.** We buy, sell, exchange and overhaul motors. Gas supplies our Specialty. Send 10¢ for our catalogue. Long Island Hobbies, 142 Rockaway Ave., Valley Stream, L. I.

**BOYS, Dealers Wanted:** Be the Distributor for our Model Car Kits for the Fisher Body Craftsmen's Guild contest in your city. Big Profits. Fastest selling Model Car Kits on the market. Send 10¢ in coin for complete details on our money making line of kits. Territory limited. Act Now. Model Supply Products, 8244 Ellis Avenue, Chicago, Illinois.

**SCALE Models of Historical Buildings.** Complete Kits, full color. New easy method construction; no carving, no painting. Particulars free. Letter Shop, Park Ridge, Illinois.

**DEALERS, Clubs, Schools:** Factory discounts on all popular makes of kits, supplies, gas models, motors, parts. We carry the most complete line in the East, and ship promptly. Send us your address for complete Stock On Hand listing and discounts. Model Airplane Associates of Rochester, 892 S. Clinton Ave., Rochester, New York.

**NOTES on Gas Engines & Models.** by Prof. Bobrovsky, 25c. Jones Co., Box 31, West Brighton, S. I., N. Y.

**RADIO Controlled 12 foot Gas job—plans now obtainable by popular demand; complete data for construction, operation.** (See Popular Mechanics, November, 1935, page 689.) Send \$5.00 or write for particulars. Radionation, Box 111, Cambridge, Mass.

### MODEL BOATS

**BLUE-prints Full Size—32 1/2" Clipper Ship.** Flying Cloud. 44 1/2" Sailing Yacht. 41 1/2" Liner, Pres. Roosevelt. Half Size 50" Schooner Yacht, Bluenose. 68" Racing Yacht, Rainbow. Advertising Special \$1.00 each. Begler, 3150—33rd St., Astoria, N. Y.

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**AERONAUTICAL Photographs.** 593 Main Street, Hyannis, Mass. Send Dime for Complete List and Postcard. Sample —All Sizes—Quality—Prompt Service.

The Jersey Mosquitoes Chapter of the N.A.A. is located in Hudson County. The chapter was formed in the middle of last December and officially elected these officers, Frank Ehling, Pres.; John Kukowski, Vice Pres.; Richard McNailey, Contest Secy.; Arthur Kennedy, Cor. Secy.; Ellis Cardaneo, Treasurer; and Ed Maher, Sgt. at Arms. The club has a total enrollment of about 45 members, 38 of which are charter members. The meetings are held every other week at Bayonne and Jersey City Y.M.C.A. The club is sponsored by the American Legion and a few outstanding individuals.

Just a word telling you of the contest activity. The chapter held a series of indoor meets throughout the winter, the time being limited because of the size of the room in which the flying takes place. The room is actually only satisfactory for class A film covered models in which good time has been done. Some of our chapter records are as follows: Class A, R.O.W., 5:17; Class A, Gliders, 20 seconds; Class B, Stick HL, 6 minutes; Class B, R.O.G., 6:36; Class B, R.O.W., 3:7; Helicopter, 1:39.

There were two trophies awarded at the end of the indoor season. There has been a

lot of work done in outdoor activities but we have not as yet had any sanctioned meets. The first one is to be held on May 2.

### Connecticut

The Ninth Annual Connecticut Model Aircraft Meet was held on Saturday, June 5, at Rentschler Field, East Hartford. The Meet this year was sponsored by the United Aircraft Corporation, Connecticut Model Airplane Association and the Hartford Y.M.C.A. No news of the winners has reached us as yet.

### Atlantic City, N. J.

We hear from the Atlantic City Model Airplane Club. Alan Stave, secretary, writes that they held an indoor meet on April 11 in the Convention Hall. It was sanctioned by the N.A.A. and was directed by Mr. Fritz of Philadelphia. High times were not made due to poor flying conditions. There were droplights and bleachers that seemed to get into the way of nearly all the ships. Three national hydro records were set up, however. Carl Kolbe's model disappeared in the darkness at the top of the auditorium, which is 135 feet high, after 8 minutes and some seconds.

### Jacksonville, Florida

The Jacksonville Model Club of 2048 Roselle Street, Jacksonville, Florida, held a spring contest in April. It was conducted under the direction of William L. Timpone, Club Advisor of the N.A.A. and sponsor of the club. Ed Lee Smith won the Class B Glider event. Incidentally, he holds the N.A.A. record for Class D Gliders, hand launched. His brother, Horace Smith, holds the N.A.A. record for Class C Gliders, hand launched for Juniors. The Smith brothers seem "to have it." We are wondering if they have beads, too.

A new junior club has been formed by Mr. Timpone which is for boys from the ages of nine to thirteen. This is a fine step toward educating the younger members of the model fraternity. After all, we must have young model fliers in order that they develop into older ones.

### Fitchburg, Mass.

The Wachusett Model Aero Club, which meets at the Fitchburg Y.M.C.A., Fitchburg, Mass., is still very active. Bob Eccleston, who is one of the ardent experimenters of the club, recently turned his attention to one bladed propellers. At a recent meeting he explained how he worked out one which increased the climb of his model considerably over that produced by a two-bladed prop. We will look to Bob for further information on this subject.

### Chicago, Illinois

A report of the activity of the Chicago Aeronauts is sent to us by the secretary, Edmund B. Swort of 102 West 72nd Street, Chicago, Illinois. He says:

"On Saturday, May 15, the Chicago Aeronauts held indoor record trials in the 132nd Regiment Armory. Many promising models were brought out but the lights and wires intervened to such an extent that only one record was broken. The events and times were:

"Dennis Turner won the Hand launched Class B Glider event with a time of 2:32.4 and Wallace Simmers was first in the Class C Fuselage event with 2:46."

### Allentown, Pa.

We hear from E. Schaffhauser, sponsor of the Flying Keystone Model Airplane Club of 1520 Liberty Street, Allentown, Pa. This is Unit No. 7 of the Air Ways Club. He says:

"We held our third annual Lehigh Valley Model Airplane Championship, Sunday, May 16. This was the first meet in which others from outside Allentown were permitted. Over 40 contestants were on hand at the Allentown-Bethlehem Airport from Bangor, Reading, Philadelphia, Scranton and Allentown, Pa., also Phillipsburg and Trenton, N.J., and New York City. Twelve medals were secured from the local business men of which Allentown retained five, Reading, four, Phillipsburg, Trenton and New York City, one each. The results were:

"Richard Metzger of 119 N. Madison Street, Allentown, won the Hand launched. Lawrence Nagle of 325 N. 10th Street, Allentown, Pa., won the Hand launched Glider event with a time of 33.6 sec. The Stick event was won by George Micott of 241 N. 12th Street, Allentown, Pa., with 3 min., 55.2 sec. George Micott also won the Cabin event with 3 min., 2 sec. Mickey DeAngelis of 473 Chestnut Street, Trenton, N.J., won the Gas Model event with a flight of 5 min., 4 sec.

"George Micott captured all honors of the meet by taking first place in the Cabin and Stick events, also setting local Senior records for Class C models. Micott is present holder of Class A Indoor Hydroplane for Seniors with 8 min., 5.4 sec. This was made at an N.A.A. sanctioned meet in Philadelphia, Pa., on March 27."

### Notices

Robert Gable of 244 North 11th Street, Reading, Pa., tells us that an outdoor flying contest will be held on August 21, sponsored by the Croll & Kechs Clothing Store of this city. It will be conducted according to N.A.A. rules. The events will be: stick model, fuselage endurance model, glider and gas model. A detail scale model event will be held in conjunction with the flying events. Anyone may enter, as it will be divided into junior and senior divisions. Applications should be sent to Croll & Kechs' clothing store, 622 Penn Street, Reading, Pa.

A request has been made by William H. Moesel of 258 Franklin Avenue, Brooklyn, N.Y., for scale model planes of the N.C. 4, the first plane to make a transatlantic crossing, the Alcock-Brown plane which made the first non-stop transatlantic crossing and the Douglas World Cruiser, which made the first round the world flight. If anyone has any information on these ships will they please communicate with Mr. Moesel.

If anyone has detail scale plans of the Fleet Trainer will they please communicate with Ernest Tanner of 138 Eagle Avenue, Brantford, Ontario, Canada, as he is anxious to build this ship.

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# First—in FLYABILITY! First—in COMPLETENESS and FINISHED PARTS!



## ✓ Check these FEATURES

DETACHABLE Wings and tail assembly. Vibration resistant of collision, to protect them. ADJUSTABLE RUDDER and elevator settings. ADJUSTABLE MOTOR SKID. Accommodates practically every motor on market. Thrust line can be varied. SHOCK-ABSORBING LANDING gear and tail wheel—exclusive with Comet. Prolong life of model by absorbing landing shocks. Monocoque type, used by newest transports, chosen because of light weight, structural strength, and ease of construction. CURTISS ROBIN chosen because of unusual inherent stability and excellent flyability. MOTOR SKID gives in event of collision—protecting motor. REMOVABLE COWL and hatches for easy accessibility to motor, battery and wing springs.

## Specifications

MODEL—Curtis Robin. POWER—any 1/2 H.P. WING SPAN—6 ft. or 11 6/11 H. P. OVERALL LENGTH—46 in. motor. WEIGHT OF MODEL—3 1/2 lbs. 2 lbs. test motor. WHEELS—3 1/2 in. air wheels.

## WHAT A VALUE!

**\$4.95**

**\$6.50**  
with airwheels  
and motor

**KIT—\$2.50**

Postage—out of the Mississippi, 30c; none if west of the Mississippi, 50c; none if ordered from Comet Drexler.

**BIG MONEY'S WORTH!**  
Complete set of Plans, all Printed Matter, and all other accessories.

## The COMET GAS MODEL

It took two years of experimenting to produce the Comet Gas Model—but every model builder who has seen it agrees that it was worth while waiting for! It's way ahead of its field in **FLYABILITY, COMPLETENESS, FINISHED PARTS, EASE OF CONSTRUCTION, and VALUE!** A pleasure to build—and a thrill to fly! Check the features, specifications and contents listed on this page—and compare them with any other Gas Model kit on the market! And remember—the Comet Gas Model really FLIES!



## COMPARE THE CONTENTS

RIBS die-cut, ready to glue in place • LANDING GEAR WIRES bent to exact shape • IGNITION SWITCH • BOOSTER CLIPS • MACHINE SCREWS and nuts, washers, etc. • LANDING GEAR wing and tail wheel springs • PRINTED ALUMINUM cowl and fire wall • SPECIAL HOOKS and wire fittings all bent to shape • Generous quantities of CEMENT covering liquid, red and yellow dope • 3 SHEETS BAMBOO PAPER • 2 LARGE PLANS giving all assembly layouts full size, no tracing to complete wing layout • AIRWHEELS • RUBBER-TIRED TAIL WHEEL • STREAMLINED STRUTS, leading and trailing edges of wing, completely finished • LEADING EDGES for tail cowl blocks, etc., ready shaped • MANY PRINTED Balsa SHEETS • SPECIAL BASS BLOCKS drilled, grooved, and slotted, ready to install—landing gear travel block, front, center and rear motor skid supports, tailwheel fork and holder, motor skids, landing gear spreader block • BIRCH PROPELLER blank, outlined, drilled and tapered, ready to carve.

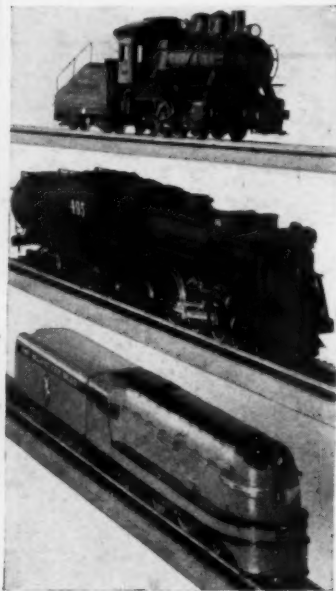


**COMET MODEL AIRPLANE & SUPPLY CO.**  
3209 West Cermak Road, CHICAGO • Eastern Branch: 638 Broadway, NEW YORK  
COMET maintains distributors in many cities throughout the United States and other parts of the world. Foreign distributors include: F. P. Sweeney, Dispersal, England; B. W. Hill, Capetown, South Africa; E. J. Hyatt, and Sony Wellington, New Zealand; South Africa: Mitchell, Johannesburg; Australia: F. G. COOK, Sydney.



Don't put off till Fall the many enjoyable hours you can spend now and all summer either at home or on vacation!

A close-up of 3 of America's lowest priced representative model locomotives built from C-D kits.



An authority on Model R.R.'s says "I'm very pleased to find them really better than expected."

This is an actual unretouched photograph of some of these extremely realistic C-D models. The models themselves look even better than the picture indicates.

See What Sport it is—

and How Inexpensive, Too, to Build These Units in the New

# CLEVELAND 100% AMERICAN SCALE & GAGE MODEL RAILROADING

## 34 KITS NOW AVAILABLE—ORDER FROM THIS LIST

Average over all sizes, Locomotives, 12"-17"; Passenger Cars, 15"; Box Cars, 8"; heights, 2 1/4".

RL-1 PRR Switcher 0-6-0 and Tender.....\$ .65	RB-5 Wabash—40 ft. wood.....\$ .45
RL-2 C&O Pacific (4-6-2) Locomotive and Tender..... .85	RB-6 Southern Pac.—40 ft. wood furn. car (SP Herald)..... .45
RS-1 Hiawatha (4-4-2) Locomotive and Tender (Streamlined)..... .95	RB-7 (Discontinued)
RS-2 Hiawatha Tap-Diner Car..... .75	RB-8 Texas & Pac.—40 ft. wood auto..... .45
RS-3 Hiawatha Coach..... .75	RB-9 AT&SF—40 ft. wood (Santa Fe Herald)..... .45
RS-4 Hiawatha Beaver Tail Car..... .75	RB-10 (Discontinued)

### BOX CARS

RB-1 NYC—40 ft. steel (NYC Herald)..... .45	RB-11 Union Pac.—50 ft. steel..... .55
RB-2 B&O—40 ft. steel..... .45	RB-12 AT&SF—50 ft. steel auto (Santa Fe Herald)..... .55
RB-3 B&O—40 ft. wood..... .45	
RB-4 Rock Island—40 ft. wood..... .45	

### FLAT CARS

RF-1 C&NW—46 ft.—50 ton..... .25	RT-1 Texaco—TCX (white) 8,000 gal..... .35
RF-2 PRR—46 ft.—50 ton..... .25	RT-2 NATX (black) 8,000 gal..... .35
RF-3 B&M—46 ft.—55 ton..... .25	RT-3 Sinclair—SDRX (black) 8,000 gal..... .35
RF-4 L&N—46 ft.—50 ton..... .25	RT-4 Gulf—GRCX (black) 8,000 gal..... .35

### GONDOLA TYPE CARS

RG-1 L&N—41 ft.—50 ton, Class G.A..... .35	RH-1 CCC&StL—55 ton, Twin Hopper, Class HM (NYC Herald)..... .40
RG-2 NYC—41 ft.—50 ton black, Class G.A. (NYC Herald)..... .35	RH-2 MP—55 ton, Twin Hopper, Class HM (MP Herald)..... .40
RG-3 MC—41 ft.—55 ton, Class G.A. (NYC Herald)..... .35	RH-3 Southern—55 ton, Twin Hopper, Class HM..... .40
RG-4 T&P—41 ft.—50 ton, Class G.A..... .35	RH-4 Illinois Central—50 ton, Twin Hopper, Class HM..... .40
RG-5 PRR—65 ft. 70 ton, Mill Gondola, Class G.M. (PRR Herald)..... .55	

These Kits are all dry—no cements or colors are included with them. The models they build are known as Representative (Rep) models. In the Fall, we will start bringing out a line of "De Luxe Models." By simply employing working couplers, detaching the dummy trucks, and replacing them with actual working trucks, all your "Rep" models can be used on your "De Luxe Model" layout. The C-D scale is 3/16" to 1 ft., the gage 3/4".

See our other big ad on the center pages of this issue

THE Hiawatha train, being the only passenger lineup in the group, is highly recommended even to beginners, as it is perhaps the simplest of the entire line of train materials to build up because of the simplicity of the design of the Hiawatha trains.

Therefore, whether it be the locomotive or one of the cars, do not hesitate to order any of this train as you will find it very simple to build, besides being printed out, including all lettering, natural colors of orange and maroon to be mounted on the wood framework of each car, cutting out, assembling the trucks, painting the roofs and just touching up the corners of the framework, as the ends are supplied painted.

On the locomotives, with the colored side strips already being supplied, it is only necessary to shape the shroud, apply the necessary paper strips, color the top gray and black, apply the side, front and end printed pieces and from here on requiring only touching up. The "works" are unbelievably simply made, especially with the way it is shown on the drawing. Of course all wheels are turned and for spokes these may either be hollowed out as suggested or else the spaces painted a dark color for greater realism. (On spoked Locomotives, you glue in spokes yourself.)

Just think! With this lineup of cars, you can have a string of freight cars 28 long, without one single duplication! It certainly gives you a great variety, and, since you are later able to add insulated trucks and operating couplers, you can use this same, very inexpensive line of cars in an operating line of trains. The C-D scale is 3/16" to 1 ft., the gage 3/4".

Send 5c for new large supplement (equal to 48-pg. catalog). Add 10c more and also get our BIG 64-pg. catalog!

**Read Before Ordering** See your dealer first—if he can't supply you, order direct. In ordering direct, remember that all transactions are subject to our regular catalog shipping instructions, most important of which are: Send check or M.O. (cash at own risk). 20 C.O.D.'s. Add 15c packing charge to ALL orders for parts. Canada, Mexico, British Isles, add 10% to ANY order sent to us; all other countries, 20%.

**Dealers!** BIG DISCOUNTS—QUICK TURNOVER. WRITE FOR FULL DETAILS.

CLEVELAND MODEL & SUPPLY CO., Inc., 1866N West 57th St., CLEVELAND, OHIO, U.S.A.

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